

Running head: AN EXAMINATION OF THE ROLE OF PERSONALITY

An examination of the role of personality and self-regulation in the gambling behaviours
of late adolescents and emerging adults

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AN EXAMINATION OF THE ROLE OF PERSONALITY

Abstract

The purposes of this study were: a) to examine the role of personality and self-regulation in the gambling behaviour participation of late adolescents and emerging adults. In particular, the present study examined if certain personality traits were more prevalent in high-risk gamblers than in young people considered low or at-risk gamblers; and, b) to examine if the ability to self-regulate helped distinguish differences among the three groups of gamblers (low-risk, at-risk, and high-risk gamblers). A sample of late adolescents and emerging adults (N = 100) attending Brock University, completed a survey that assessed current gambling behaviour (both frequency and consequence experience), personality, self-esteem, and self-regulation. It was found that high-risk gamblers had lower scores on the personality dimensions Emotionality, Conscientiousness (especially on its Prudence facet), and Honesty-Humility (especially on its Fairness, Greed Avoidance, and Modesty facets) than at-risk or low-risk gamblers and higher scores on impulsive sensation seeking and impulsivity than at-risk or low-risk gamblers. Similarly, high-risk gamblers reported lower levels of self-regulation than both at-risk and low-risk gamblers. The findings from this study support past research which suggests that young people who gamble at problematic levels differ on many personality traits and often have more difficulty self-regulating than young people who do not participate at problematic levels. Findings may aid in the development of intervention and prevention programs that utilize specific self-regulation techniques with a young gambling population.

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An examination of the role of personality and self-regulation in the gambling behaviours
of late adolescents and emerging adults

Introduction

Within the past two decades, gambling accessibility and availability have increased considerably (Gupta & Derevensky, 2008; DiClemente, Story, & Murray, 2000). Various gambling outlets including casinos, slot machines, lotteries and internet gaming, have become increasingly more popular. Similarly, the legalization of many gambling outlets has helped influence its popularity (DiClemente et al., 2000). Although most gambling activities are legal only for an adult population, gambling has become a popular form of entertainment for adolescents. In fact, research has shown that adolescents engage in both legal and illegal gambling activities (Messerlian, Derevensky, & Gupta, 2005). Although gambling remains simply a form of entertainment for most adolescents, it has the potential to be problematic for some (Gupta, Derevensky, & Ellenbogen, 2006).

Young people who frequently participate in gambling activities are more likely to experience consequences that may be carried into their adult lives than those young people who gamble at recreational levels (Messerlian et al., 2005). It is therefore important to understand who is at greater risk of gambling at a problematic level. To identify those youth at greatest risk, a stronger understanding of biological and behavioural risk factors such as personality and self-regulation in late adolescents (aged 17) and emerging adults (aged 18-24) (see Arnett, 2007; Arnett & Brody, 2008) is needed.

Literature Review and Rationale

Gambling definitions. Research on adolescent risk-taking behaviours has been conducted for many years. Although adolescent gambling falls under the umbrella of risk-taking behaviours, it is only recently that gambling has been the focus of research (Gupta & Derevensky, 2008). Gambling traditionally has been defined in research as “wagering of money on the outcome of a game or event, with the hopes of winning larger sums of money” (Gupta & Derevensky, 2008, p. 207). Newer definitions of gambling however are broader and include any valuable, to convey that gambling does not necessarily have to involve the wagering of money, but rather, can include the wagering of other items that hold value to the individual (Ontario Problem Gambling Research Centre, 2007). Consistent with the definition provided by the Ontario Problem Gambling Research Centre (2007), the present study broadly defined gambling as the betting or wagering of money or valuables on games or events with uncertain outcomes to capture a comprehensive representation of gambling.

Gambling continuum. Gambling behaviours have been described on a continuum from those who do not participate in any gambling endeavours, to those who gamble at problematic levels (Chalmers & Willoughby, 2006). Narrow gambling classifications are based on the individual’s reported experience of gambling related consequences in the past year. Broad gambling classifications are based on the individual’s frequency of gambling participation, as well as their experience of gambling related consequences (Poulin, 2000). Young people can be grouped into one of four gambling classifications: non-gamblers, low-risk gamblers, at-risk gamblers, or high-risk/problem gamblers.

Non-gamblers are individuals who do not participate in, or participate rarely in, any gambling activities (Lawrance, Dane, Yardley, Root, & McPhee, 2005). Low-risk gamblers are individuals who gamble infrequently and therefore do not experience any gambling related consequences (Chalmers & Willoughby, 2006). At-risk gamblers are those individuals who are at risk of becoming problem gamblers given the regularity of their participation (Lawrance et al., 2005). And lastly, high-risk/problem gamblers are those individuals who have regular participation in gambling activities and who subsequently experienced negative consequences that disrupt various areas of their lives (Chalmers & Willoughby, 2006; Lopez Vieta, 1998).

Gambling classification terminology. Within the literature, researchers use a variety of terms to describe gamblers, e.g., problem gambler, pathological gambler, probable pathological gambler or high-risk gambler. Classification terms may differ based on the gambling severity screening tool that is utilized. Some researchers using the South Oaks Gambling Screen (SOGS) refer to “problem gambling” denoting an individual who gambles at problematic rates and who has experienced several gambling related consequences (Poulin, 2002; Stinchfield, 2002). The SOGS screen consists of 20-items that are specifically regarding the loss of money from gambling practices, gambling related consequences, and sources of money used for gambling behaviours (Stinchfield, 2002).

Other researchers have used the DSM-IV, another widely used gambling screening tool. This tool is designed to assess gambling behaviours using a clinical interview to examine gambling frequency, duration of gambling behaviours, types of gambling activities one engages in, average time spent gambling and gambling related

consequences (Ladouceur, Ferland, Poulin, Vitaro, & Wiebe, 2005). However, some researchers do not include the clinical interview as part of the assessment (Wohl, Young, & Hart, 2005). The DSM-IV classifies individuals as either non-pathological, probable pathological, or pathological gamblers (Ladouceur et al., 2005). The essential feature of pathological gambling is “persistent and recurrent maladaptive gambling behavior that disrupts personal, family, or vocational pursuits” (Korn & Shaffer, 1999, p. 295). Probable pathological gamblers are those individuals who have less severe gambling behaviors than pathological gamblers but who are similarly presenting maladaptive tendencies that indicate future problems and a probable pathological status (Sommers, 1988).

In the current study, neither “problem” nor “pathological” gambler will be used to indicate problematic gambling. Instead, gamblers with high gambling frequencies and/or high levels of gambling consequence experience will be classified as “high-risk” gamblers. This classification was chosen, first, as it does not attempt to diagnose pathological gambling, and second, this study used a broad definition of problematic gambling and examined both frequency and consequences experienced when placing individuals into a gambling classification. Further, gambling classifications were based on SOGS scores rather than the DSM-IV because we were not conducting a clinical assessment and the SOGS is the tool most frequently used within a late adolescent, emerging adult population thus allowing for greater ease in comparison of current study findings and the existing literature.

Measurement challenges. It is important to note however, that problems with the SOGS have been identified. For example, when compared to the diagnostic criteria of the

DSM-IV, the SOGS typically obtains higher prevalence rates of problem gambling. One often cited reason for this is, question misunderstanding. Specifically, question content differs between the two screening tools and research has consistently noted that the SOGS yields a higher level of question misinterpretation than the DSM-IV (Stinchfield, 2002). It should be stated however, that these high false positive rates exhibited by the SOGS are often greater in samples of adolescents rather than in adults (Gambino, 2007). Similarly, it has been suggested that the reason discrepancies are found between the two screening tools is because the diagnostic criteria represents different levels of gambling severity. In particular, the DSM-IV diagnostic criteria represents more severe gambling behaviours and may be more accurately used with individuals in the later stages of the disorder, while the SOGS represents less severe signs of gambling and may be better utilized in the earlier stages of the disorder (Stinchfield, 2002).

Prevalence rates. In Western society, adolescence is prolonged and young people are faced by new challenges with regard to self-regulation, personal responsibility, identity development, and personal development; as a result, this may put them at increased risk for engaging in problematic behaviours (Shulman et al., 2009). Prevalence rates of adolescent problem gambling are alarming as they have been estimated to be two to four times that of adults (Dickson, Derevensky, & Gupta, 2004). Of similar concern, the age of onset for gambling has been steadily decreasing. Research suggests that children begin gambling as young as nine years of age (Gupta & Derevensky, 2008). Children at this early age engage in various forms of gambling endeavours such as, card games for money, lottery ticket play, bingo, and/or the wagering of money on sport events and video games (Gupta & Derevensky, 2008).

Research has found that up to 78% of adolescents report gambling at least once a year (Ladouceur et al., 2005). Further, research has demonstrated that approximately one fifth of all adolescents gamble on a weekly basis (Gupta et al., 2006). Research demonstrates that between 10 to 15% of adolescents can be considered at-risk gamblers and between four and eight percent of adolescents can be considered problem gamblers (Messerlian et al., 2005). In addition, between three and five percent of young people aged 13 to 17 display characteristics and behaviours suggestive of later adult problem gambling such as obsessive preoccupation with gambling, lying to friends and relatives about gambling related behaviours, going back to win money previously lost, and choosing gambling over other priorities and commitments (Delfabbro, Lahn, & Grabosky, 2006).

Similarly, research indicates that college student gambling rates are also on the rise. In particular, it is noted that estimates of college student gambling can range from 42-85% (Cyders and Smith, 2008; LeBrie, Shaffer, LaPlante, & Wechsler, 2003; Weinstock, Whelan, Meyers, & Watson, 2007). Also, it has been estimated that between four and 14% of college students display gambling tendencies that are indicative of a problem gambling status and between three and six percent of college students have gambling behaviour tendencies sufficient to diagnose a pathological gambling status (Weinstock et al., 2007). College gambling rates are of equal importance given that those attending college/university are in the late teens, early twenties age range and are therefore representative of the late adolescent and emerging adult population. Therefore, late adolescence and emerging adulthood is an important developmental time period to study as prevalence rates of gambling among young people continue to rise (Ladouceur et

al., 2005) and have recently surpassed that of adult prevalence rates (Parker, Taylor, Eastabrook, Schell & Wood, 2008).

Gambling related impacts. Research on the impact of gambling, has indicated that problem gambling among young people can have negative consequences in both the social and personal lives of those affected. Consequences include, but are not limited to, higher rates of depression and anxiety, increased suicide attempts, risk of substance and alcohol abuse disorders, poor general health (Messerlian et al., 2005), disruptions in an individual's family or peer relationships, problems associated with school and work environments, and has also been linked to participation in criminal activities leading to criminal punishment (Cronce, Corbin, Steinberg, & Potenza, 2007).

Young people who gamble at problematic levels are more likely to become adult problem gamblers and the consequences of gambling are heightened in adulthood (Delfabbro et al., 2006). In particular, adolescents and emerging adults are often unburdened by significant personal and financial hardships because they are still in a stage of dependence and generally are less likely to own expensive possessions or assets. Adults on the other hand, are at a much greater risk of losing close relationships as well as suffering a significant monetary loss due to having greater assets (Delfabbro et al., 2006).

It is important that gambling no longer be viewed simply as an adult problem. Prevalence rates are continually increasing and research indicates that many late adolescents also suffer the consequences of problem gambling (Ladouceur et al., 2005). As a result, it is important that a better understanding of young people with problematic tendencies and those at risk of developing problematic gambling behaviours be acquired.

The present study was designed to gain a stronger understanding of biological and behavioural factors which influence gambling behaviours.

Risk factors. There are many different demographic, behavioural, and biological factors that may increase one's likelihood of developing gambling problems. Commonly noted factors include gender (males are more likely to be problematic gamblers than females), depression, frequent engagement in drug or alcohol use, early age of gambling behaviour onset, high levels of gambling participation, family gambling engagement, certain personality factors (impulsivity, sensation seeking, low self-regulation, and low self-discipline) (Cronce et al., 2007; Johansson, Grant, Won Kim, Odlaug, & Gotestam, 2009), and low self-esteem (Kaare, Mottus, & Konstabel, 2009). This study focused on self-esteem, personality, and self-regulation.

Self-esteem. While several risk factors are believed to contribute to one's chances of developing problematic gambling tendencies, it is only recently that self-esteem has been a focus of research. Kaare et al. (2009) argue that gambling is a self-defeating behaviour given its potential for negative monetary consequences in that large sums of money can be lost in minimal amounts of time and because it violates the personal need to self-regulate. Self-regulation is necessary in order to avoid self-defeating behaviour and gambling often inhibits one's ability to appropriately self-regulate. Further, self-defeating behaviours are often linked to emotional distress and other emotional disorders such as anxiety, low self-esteem, and depression (Kaare et al., 2009).

Current research on gambling and self-esteem has found that problem gamblers consistently demonstrate significantly lower self-esteem (Delfabbro et al., 2006; Parke & Griffiths, 2005), have poorer mood states, have lower general health, and feel more

alienated from society than non-problem gamblers (Delfabbro et al., 2006). Although the exact cause of such feelings are unknown, it has been suggested that the secrecy associated with problematic gambling leaves gamblers in a state of constant psychological distress which results in a reduction of self-esteem (Parke & Griffiths, 2005).

Although self-esteem has been regarded as a risk factor for gambling as well as other risk behaviours, the direction of this relationship has yet to be discovered. In other words, it is unknown whether or not low self-esteem is a product of problem gambling behaviour, or simply, a risk factor (Kaare et al., 2009).

Personality traits. When examining problematic gambling behaviours, research indicates that there may be particular personality traits that are specific to people exhibiting problematic gambling tendencies (Gupta et al., 2006). Specifically, research has noted that individuals who experience problematic gambling behaviours express self-regulatory problems (Gupta et al., 2006), are more impulsive (Loxton, Nguyen, Casey, & Dawe, 2008; Johansson et al., 2009), exhibit higher levels of sensation seeking (McDaniel & Zuckerman, 2003; Johansson et al., 2009), and have lower levels of self-discipline (Bagby et al., 2007) than individuals who do not gamble at problematic levels.

Impulsivity and sensation seeking. Impulsivity can be understood as the process of acting without thought or planning or the inability to exert self-control (Nordin & Nylander, 2007). Sensation seeking on the other hand, is characterized by a need to “seek new and complex feelings and to take risks to achieve this goal” (Nordin & Nylander, 2007, p.114). Individuals high in impulsivity and sensation seeking traits are believed to

be more likely to participate in risk-taking behaviours such as gambling (Nordin & Nylander, 2007).

Research on impulsivity and sensation seeking in a gambling population has consistently shown that problem or pathological gamblers exhibit higher levels of impulsivity (Loxton et al., 2008; McDaniel & Zuckerman, 2003; Nordin & Nylander, 2007), sensation seeking, and impulsive sensation seeking traits than non-problem gamblers (McDaniel & Zuckerman, 2003; Nordin & Nylander, 2007). In addition, pathological gamblers tend to score high on traits such as extravagance, harm avoidance, and disorganized behaviour and low on traits such as self-directedness and cooperativeness (Nordin & Nylander, 2007). It is evident from a review of the above research that individuals with problematic gambling behaviours exhibit high levels of impulsiveness, sensation seeking, and impulsive sensation seeking.

Five-factor model of personality. While impulsivity and sensation seeking are among the most widely researched personality traits in the realm of gambling research, several other personality profiles have been noted in high-risk gamblers. In particular, many studies examining the correlates of gambling and personality have employed a five-factor model of personality to see where differences emerge. The five-factor model of personality employs five distinct personality domain in order to better understand the personality profiles of different populations (Kaare et al., 2009). When examining personality and gambling, research has found that pathological gamblers score higher on the Neuroticism domain and lower on the Conscientiousness domain than the non-pathological gamblers (Bagby et al., 2007; Kaare et al., 2009). Specifically, pathological gamblers have been found to have significantly higher scores on all the Neuroticism facet

scales, especially on the Immoderation (“inability to control cravings or urges” (Kaare et al., 2009, p. 381)) and Depression facets. Neuroticism “represents a predisposition to develop psychopathology and to experience a wide range of negative affects” (Bagby et al., 2007, p. 878), while Conscientiousness is associated with impulse-control as it encompasses the ability to resist impulses or urges, control desires, and develop strategies to control behaviour (Bagby et al., 2007).

Research utilizing the five-factor model of personality has also found that significant differences exist between pathological gamblers and non-pathological gamblers with regards to self-discipline. Particularly, pathological gamblers score significantly lower on the Self-Discipline facet of the Conscientiousness domain than non-pathological gamblers (Bagby et al., 2007). This finding should be interpreted with caution however as some research has found that gamblers are impossible to differentiate on this trait (Kaare et al., 2009). Also important to note, research by Bagby et al. (2007) found that pathological gamblers were indistinguishable from non-pathological gamblers on the Extraversion facet, Excitement-seeking. This finding is interesting as it is inconsistent with similar gambling research that demonstrated that excitement-seeking, also known as sensation seeking, is higher for gamblers than non-gamblers (Kaare et al., 2009; McDaniel & Zuckerman, 2003; Nordin & Nylander, 2007).

The above review of literature suggests that individuals with certain personality traits are more likely to be problem gamblers. Although research regarding problem gambling has risen significantly over the past several years, research on gambling risk factors is limited (Johansson et al., 2009). In addition, it is evident from the aforementioned literature, that discrepancies in our understanding of personality and

gambling do exist. It is therefore important that more research be conducted within the realm of personality and gambling in order to ensure the most accurate information is obtained.

To date, most of the research on personality and gambling has been conducted using the five-factor model of personality. In order to expand current knowledge in the realm of personality and risk behaviours, the present study utilized the HEXACO Personality Inventory which is a revised six-factor personality model (Lee & Ashton, 2006). It was believed that the HEXACO Personality Inventory would provide a more comprehensive measure of personality and would therefore aid in the production of a more complete picture of personality and gambling behaviours in young people.

HEXACO Personality Inventory. The HEXACO Personality Inventory (HEXACO-PI) is a six-dimensional structure of personality. By the end of the 1990's most researchers had agreed that five broad dimensions known as the Big Five Factors accounted for as much personality variation as possible. In recent years however, evidence has shown that an alternative representation of personality structure may be more accurate. The alternative structure, known as the HEXACO model, consists of six personality dimensions rather than five (Ashton & Lee, 2007). The six domains that make up the HEXACO-PI include Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience (Lee & Ashton, 2006). Three of the domains contain content that is very similar to the corresponding domains of the five-factor model. These domains include Extraversion, Conscientiousness, and Openness to Experience. The remaining three domains however, do not map onto the domains of the five-factor model. Specifically, the HEXACO factor known as Honesty-

Humility does not have a match in the five-factor model as this domain represents a newly added dimension (Lee, Ashton, Morrison, Cordery, & Dunlop, 2008). The additional dimension, Honesty-Humility, is especially important when studying a gambling population as this domain specifically explores the motivations behind one's need to gamble. The remaining two domains; Agreeableness and Emotionality, although similar in name to that of the five-factor model, are not identical to the domains Agreeableness and Emotional Stability (vs. Neuroticism) represented in the five-factor model. In sum, the HEXACO personality model contains content both similar and dissimilar to its five-factor predecessor as well as contains a newly added domain not previously represented in the five-factor model (Lee et al., 2008) thus allowing for a more comprehensive exploration of the role of personality in gambling behaviour .

Each of the six domains represented in the HEXACO-PI correspond to certain personality traits. Within each of these domains, there lie four facets level scales that contain more specific personality traits that characterize that particular domain.

Honesty-humility domain. Honesty-Humility represents a tendency to be fair and true when interacting with other people (Ashton & Lee, 2007). The facets encompassed within this domain are Sincerity, Fairness, Greed Avoidance, and Modesty. The Sincerity facet scale assesses a tendency to be authentic when interacting with others. Individuals with higher scores are less likely to be willing to manipulate other people. The Fairness scale is characterized by a tendency to avoid fraud or corruption. Individuals with low scores would be willing to cheat or steal for monetary gain. The Greed Avoidance facet measures one's need to possess lavish goods and obtain wealth. Lastly, the Modesty facet scale assesses a tendency to be modest and inconspicuous (Lee & Ashton, 2004).

Research on gambling motives often cite curiosity, to gain prestige from others (Smith & Preston, 1984), leisure and recreation, form of excitement, monetary gain, socialization, and avoidance (Lee, Chae, Lee, & Kim, 2007; Lostutter, Crounce, & Larimer, 2002; Smith & Preston, 1984) as the dominant gambling motives among young people. Although it appears that the motives for gambling have not changed over the years, it is evident in research that the role of the monetary motive has increased in the past few decades (Lee et al., 2007; Smith & Preston, 1984). The present study utilized the Greed Avoidance and Modesty facets (which measure one's interest in possessing lavish wealth and luxury items as well as their tendency to consider themselves superior and entitled to privileges others may not be afforded) of the Honesty-Humility domain in order to gain insight into the possible relation between the monetary motive and personality.

Emotionality domain. The Emotionality domain includes traits such as empathy for others, emotional attachment to others, as well as harm-avoidant and help-seeking tendencies (Ashton & Lee, 2007). The four facets represented by this domain are Fearfulness, Anxiety, Dependence, and Sentimentality. The Fearfulness facet assesses a person's tendency to experience fear. In other words, it looks at whether or not a person likes to experience things that cause a fearful response or if they would prefer to avoid activities that may elicit physical harm. The Anxiety facet measures one's tendency to worry and experience stress. Individuals with high scores are likely to be worried and stressed even when presented with rather minor problems. The Dependence facet assesses a person's need for emotional support from others. Individuals with high scores on this facet enjoy sharing their struggles with people who will in turn provide them with

comfort. And lastly, the Sentimentality facet looks at a person's tendency to feel strong emotional connections with other individuals (Lee & Ashton, 2004).

Extraversion domain. The Extraversion domain examines one's desire for engagement in social events. Specifically, this domain looks at one's tendency to be social, to be a leader, or to be entertaining (Ashton & Lee, 2007). The four facets that exist within this domain include Social Self-Esteem, Social Boldness, Sociability, and Liveliness. The Social Self-Esteem facet looks at whether or not a person has a positive self-regard in social situations. The Social Boldness facet level scale assesses one's confidence and comfort in several different contexts. Low scorers tend to be shy and feel uncomfortable when in a leadership role. The Sociability facet measures one's predisposition to enjoy conversing with others as well as assesses their enjoyment in social situations and at social events. And finally, the Liveliness scale looks at an individual's enthusiasm and energy in a variety of contexts (Lee & Ashton, 2004).

Agreeableness domain. The Agreeableness domain represents a propensity to be forgiving and to exhibit a high tolerance for others (Ashton & Lee, 2007). The facet scales residing within this domain include Forgiveness, Gentleness, Flexibility, and Patience. The Forgiveness facet assesses one's willingness to trust and befriend individuals who may have caused them harm in the past. The Gentleness facet measures one's inclination to be mild and merciful when dealing with others. The Flexibility facet assesses a person's motivation to compromise and work well with others. And the Patience facet looks at whether or not an individual can remain calm and avoid anger in various contexts (Lee & Ashton, 2004).

Conscientiousness domain. The Conscientiousness domain examines one's engagement in task-related activities. Such activities may include organization, preparation, planning, or work (Ashton & Lee, 2007). Within the Conscientiousness domain there are four facet scales. These facet scales include Organization, Diligence, Perfectionism, and Prudence. The Organization facet scale measures one's need to have order in their surroundings. High scores on this facet indicate an individual prefers order and structure in their environment. The Diligence facet assesses an individual's tendency to be a hard worker. Those individuals with high scores present a strong work ethic and are willing to work hard. The Perfectionism scale looks at whether or not an individual is thorough in their work and pays particular attention to detail. And, finally, the Prudence scale measures one's ability to inhibit impulses (Lee & Ashton, 2004).

Openness to experience domain. The final domain represented in the HEXACO-PI is the Openness to Experience domain. This domain examines an individual's openness to learning, imaging, and abstract ideas. Traits that are associated with this domain include curiosity, imaginativeness, and depth (Ashton & Lee, 2007). The four facets represented in this domain are Aesthetic Appreciation, Inquisitiveness, Creativity, and Unconventionality. Aesthetic Appreciation looks at whether or not a person gets enjoyment from exploring art and nature. The Inquisitiveness facet assesses a tendency to find information about, experience, and engage in the human world. The Creativity facet measures one's desire for originality and experimentation. And lastly, the Unconventionality facet assesses one's tendency to be accepting of things that are out of the ordinary (Lee & Ashton, 2004).

Self-regulation. Although it is important to understand the risk factors associated with gambling behaviour, it is equally important to have an understanding of the factors that may potentially decrease one's chances of acquiring problematic gambling tendencies. One possible factor that has recently been explored is the ability to self-regulate.

Self-regulation and adolescence. Adolescence and emerging adulthood are periods in which young people are at a crossroads between decreasing supervision from parents or adult figures and increasing autonomy and independence. As this transition progresses it is important that these young people develop the ability to self-regulate and therefore increase the regulation of their own behaviours and emotions in order to succeed in the stage of adulthood (Percy, 2008). "Self-regulation is a complex process and refers generally to efforts of a person to alter or maintain his or her responses through such coping processes as self-monitoring, evaluation, control, goal setting, self-reward, and expression of emotion, especially in challenging circumstances" (Mason et al., 2010, p. 156).

Self-regulation is a critical component in both the physical and emotional development of young people. Specifically, self-regulation plays an important role in the development and maintenance of positive and healthy behaviours and mental health exhibited in adolescence and emerging adulthood (Mason et al., 2010; Percy, 2008). During the period of adolescence and emerging adulthood, young people participate in risk-taking behaviours at an amplified rate. Similarly, during this time, cognitive structures in the brain that support and enhance decision making and self-regulation are continuing to develop and are beginning to mature (Patrick, Blair &, Maggs, 2008).

Research has suggested however, that individuals with the ability to utilize self-regulatory processes may be at a reduced risk of participating in risky endeavours and may therefore be more capable of expressing healthier behaviours (Patrick et al., 2008).

Dishion and Connell (2006) have described the ability to self-regulate during the period of adolescence as a form of resilience. Specifically, the authors note that the ability to self-regulate may play a crucial role in the development of resilience in children and youth who live in or are exposed to high-risk environments. It is believed that self-regulation acts as a moderator for problem substance use. Although adolescence and emerging adulthood is a period of time in which experimentation is expected, only some of these young people develop problematic behaviours into their adulthood. Percy (2008) notes that young people who acquire control over their substance use in adolescence may be more capable of resisting temptation to escalate this problem behaviour. Consequently, the development of self-regulatory skills in adolescence may protect these young people from exhibiting problem behaviour in later adulthood (Percy, 2008).

Self-regulation and risk behaviours. Research regarding self-regulation and gambling in both adult and adolescent samples is limited. The research that has been conducted however, has noted that pathological gamblers tend to have less self-regulatory behaviours, and often express more carefree and outgoing attitudes than non-pathological or social gamblers (Gupta et al., 2006). The role of self-regulation in the acquisition of other addictive and risk behaviours nevertheless, has been explored more extensively. For instance, when examining substance use, research has consistently demonstrated that individuals with substance dependence demonstrate considerable impairments in their ability to self-regulate (Dishion & Connell, 2008; Patrick et al., 2008; Verejo-Garcia,

Rivas-Perez, Vilar-Lopez, & Perez-Garcia, 2007). In particular, these individuals lack the ability to inhibit initial responses and are therefore unable to construct more appropriate strategies when necessary. Similarly, these individuals show less awareness regarding the most efficient strategy to use when approaching a task (Verejo-Garcia et al., 2007).

Likewise, research has found that possessing the ability to self-regulate reduces a young person's chances of participating in other risk behaviours such as delinquent behaviour, peer deviance, and later anti-social behaviour at problematic levels (Dishion & Connell, 2008; Gardner, Dishion & Connell, 2008; Patrick et al., 2008). Research has indicated that there is a significant interaction between self-regulation and peer deviance in predicting antisocial behaviour in adulthood. Specifically, it has been found that peer deviance is not a strong predictor of later antisocial behaviour in young people when young people present a strong ability self-regulate (Gardner et al., 2008). Given that research has found a link between gambling and substance abuse and gambling and antisocial behaviours (Willoughby, Chalmers & Busseri, 2004), it is therefore important to examine if there is a link between self-regulation and gambling.

Purpose of the present study. The purpose of this study was to examine whether personality and self-regulation differentiated among the different classifications of gamblers. Personality was assessed using a six-factor model of personality rather than the widely used five-factor model. The present study examined if certain personality traits were more prevalent in high-risk gamblers than in low or at-risk gamblers. This study was the first to utilize the HEXACO Personality Inventory, which is a six-factor model of personality, with a late adolescent and emerging adult gambling population.

Previous research demonstrated that the ability to self-regulate may directly and indirectly relate to adolescent risk behaviour participation (Dishion & Connell, 2008; Gupta et al., 2006). Therefore, this study examined if the ability to self-regulate differed among low-risk, at-risk, and high-risk gamblers.

Research questions and hypotheses. Two research questions were developed to examine the role personality and self-regulation played in the gambling behaviours of young people. These questions were: (1) Do specific personality traits differ among young people classified as low-risk, at-risk, or high-risk gamblers? and (2) Does young people's ability to self-regulate differ among low-risk, at-risk, and high-risk gamblers?

It was hypothesized that high-risk gamblers would produce lower scores on the Honesty-Humility domain of the HEXACO-PI, particularly on the Fairness and Greed Avoidance facets, than low or at-risk gamblers. Secondly, it was hypothesized that high-risk gamblers would have lower scores on the Conscientiousness domain of the HEXACO-PI, especially on the Diligence and Prudence facets, than low or at-risk gamblers. Thirdly, it was hypothesized that high-risk gamblers would exhibit lower self-esteem and higher levels of sensation seeking and impulsivity than their low or at-risk gambling peers. Finally, it was hypothesized that low-risk and at-risk gamblers would present a stronger ability to self-regulate than those individuals classified as high-risk gamblers.

Methodology

Procedure

The Brock University Research Ethics Board (REB) provided ethical clearance for the completion of this study (see Appendix A).

Participant recruitment. A sample of 100 participants (34 males and 66 females) attending Brock University, ranging in age from 17 to 24 years old ($M = 19.88$ years, $SD = 2.17$ years; males, $M = 21.13$ years, $SD = 2.02$; females, $M = 19.30$ years, $SD = 1.96$), were included in this study. The upper age limit of 24 was chosen as it encompassed both a late adolescent as well as emerging adult population.

Ninety-four percent of participants were Canadian citizens, 49.5%¹ ($n = 47$) of these participants however, also indicated that they associated with another ethnic background other than Canadian. The most commonly reported ethnic backgrounds were European (27.4%), Asian (9.5%), and British (8.4%). Data on year of current study and faculty membership indicated that the participants' current year of study ranged from one to seven ($M = 2.21$, $SD = 1.59$). All six faculties were represented and the most common faculty membership was to the faculty of Social Sciences (36.4%)², followed by the faculty of Education (20.2%), the faculty of Business Administration (17.2%), then the faculties of Applied Health Science and Humanities (both 10.1%), and lastly, the faculty of Math and Science (6.1%). Finally, the age of reported gambling onset ranged from seven to 21 years ($M = 16.32$ years, $SD = 3.27$ years)³ with the ages of 18 (35.6%) and 19 (13.6%) being the most commonly reported age of gambling behaviour onset.

Promotion of study. To acquire participants and ensure that all eligible students were aware of the study, two lecture presentations were delivered in large first year classes in the Social Sciences faculty and several posters were distributed throughout Brock University for the duration of the data collection period (see Appendix B for a sample poster). Recruitment strategies targeted gamblers.

¹ Five participants did not answer this question.

² One participant did not answer this question.

³ Forty-one participants did not answer this question.

Data collection.

Consents and ethical issues. All participants were required to read and sign a consent form at the beginning of research process (see Appendix C). Research participation was voluntary and participants were advised that they may withdraw from the study at any time without penalty prior to beginning the data collection process.

Confidentiality. Certain precautions were taken to ensure confidentiality of information. All survey data was void of any identifying information and therefore, participants were advised that they should not include their name on any survey materials. All consent forms were kept in a separate locked cabinet. Therefore, no personal identifying information was linked with the data.

Survey administration. All interested individuals participating in this study were required to email the researcher at the address provided on the research recruitment flyer. Interested participants were then provided with a list of times and dates of survey sessions in which they could attend. Each participant was only required to attend one survey session. Survey sessions were set up several times throughout the testing months and were held at various times in order to allow for the most convenience for the participants.

The survey sessions were conducted in a research lab on Brock University property. To begin the data collection process, participants were instructed to go to the room in which the survey session of their choice was being held. At that time, each participant was given two copies of the consent form (one to keep for their records and one to be signed and given back to the researcher). Participants were advised to read the consent form, ask any questions if necessary, and then sign one copy of the form and

return it back to the researcher. Once the participant had signed and returned the consent form, they were provided with a survey. All participants were encouraged ask questions at any time and skip any questions on the survey that they did not feel comfortable completing.

Debriefing. Once participants had completed the survey, they were asked to give all survey materials back to researcher, and were then provided with a debriefing form. The debriefing form thanked participants for their involvement in the study and explained to them how the results of the study would be used in the future. Help-line phone numbers were also provided on the form, as well as the contact information for the principle researcher. Finally, at the bottom of the letter, participants were provided with gambling facts and information about the signs of problem gambling (see Appendix D).

Data Storage. During the research process all survey data was locked in the research lab of Dr. Heather Chalmers on Brock University property. Similarly, all consent forms were locked in a separate cabinet from all other survey data. Access to the data was restricted to Kate Twigger and Dr. Heather Chalmers. Survey data will be kept for seven years at which point it will be shredded.

Incentives. All participants were given the option between two different incentives. Participants could either accept a one and a half hour research credit towards a Brock University course that included credit as a requirement, or they were eligible to be entered into a draw to win a \$100.00 Best Buy gift card. Participants were able to choose only one option.

Measures

Demographics. Participants were asked to indicate their age, sex, year and faculty of study, and ethnic background for demographic purposes.

Gambling.

Gambling consequences.

South Oaks Gambling Screen (SOGS). The SOGS is a paper and pencil assessment that examines problematic gambling through the measurement of gambling related consequences. This assessment categorizes participants into one of three categories: non-problem gamblers, at-risk gamblers, or problem gamblers⁴ (Stinchfield, 2002; Poulin, 2002).

The SOGS screen consists of 20-items that are specifically regarding the loss of money from gambling practices, gambling related consequences, and sources of money used for gambling behaviours. In a study examining the psychometric properties of the SOGS assessment tool, Stinchfield (2002) found that the SOGS demonstrated suitable reliability and validity. The study found that the general population sample had significantly lower SOGS scores on average than the clinical sample, providing excellent evidence of construct validity (Stinchfield, 2002). Findings indicated that the SOGS established suitable convergent validity in the general population sample ($r=.77$) (Stinchfield, 2002). Cronbach's alpha for this sample was .87.

Gambling Frequency. Participants were asked to indicate all gambling activities they participated in and the frequency at which they participated in each of the activities indicated. A carefully constructed list of 18 gambling activities was provided. This list

⁴ Classifications were modified for the present study and included low-risk, at-risk, and high-risk gambling classifications. Further explanation of the classifications are found on p.28.

was believed to include all known forms of gambling. Items included, but were not limited to: lottery tickets, bingo, card games, casinos, internet betting, etcetera. An eight-point scale ranging from *never in the past year* to *daily* was provided. Higher scores indicated more frequent participation in a gambling activity. Gambling frequency was measured using the same categories to assess past year gambling frequency as The Canadian Problem Gambling Index. This scale was chosen so that comparisons could be made between the results of the present study and previously conducted studies. For this sample, Cronbach's alpha was .78.

Personality.

Six-factor personality model.

HEXACO Personality Inventory. Personality was assessed using the HEXACO Personality Inventory (Lee & Ashton, 2006). The HEXACO-PI is a six-dimensional model of personality structure. The 100-item version was used for the current study with 16 items addressing each of the six HEXACO domains. The remaining 4 items measured Altruism; for the purpose of the present study however, altruism was not analyzed. The inventory is used to assess personality characteristics of individuals and consists of six domains including: Extraversion, Conscientiousness, Openness to Experience, Honesty-Humility, Agreeableness, and Emotionality (Lee & Ashton, 2006). The HEXACO-PI has been validated both in adult community samples as well as college student samples. The HEXACO-PI was shown to exhibit high internal consistency with factor level reliabilities ranging from .87 to .91. Construct validity was demonstrated and it was confirmed that the measure could generalize beyond the college student context (Lee & Ashton, 2006). For this sample, Cronbach's alpha was .86 for the entire scale and .83 for the

Extraversion domain, .88 for the Conscientiousness domain, .81 for the Openness to Experience and Honesty-Humility domains, .84 for the Agreeableness domain, and .86 for the Emotionality domain.

Impulsivity and sensation seeking.

ImpSS Inventory. The Impulse Sensation Seeking (ImpSS) Inventory was used as an additional measure of personality. This measure looked specifically at the impulsivity and sensation seeking personality traits (McDaniel & Zuckerman, 2003). The ImpSS is part of the larger Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) five-factor model. The ImpSS consists of 19-items in total; eight items addressing the impulsivity trait and 11 items measuring the sensation seeking personality trait. Participants read each statement and indicated *true* or *false* to specify whether or not they felt the item described what they would do (McDaniel & Zuckerman, 2003). The impulsivity items described a lack of planning and tendency to act impulsively without thinking. The sensation seeking items described general need for thrills and excitement, a preference for unpredictable situations and friends, and the need for change and novelty (McDaniel & Zuckerman, 2003). Cronbach alphas for males and females were .77 and .81, respectively (Zuckerman, 2002). For this sample, Cronbach's alpha was .76 for the entire sample and .77 for males and .76 for females.

Self-esteem.

Rosenberg Self-Esteem Scale. In order to measure self-esteem, the Rosenberg's Self-Esteem Scale was utilized (Rosenberg, 1965). The Rosenberg Self-Esteem Scale measures global self-esteem with emphasis on factors such as personal worthiness, appearance, and social competence. The scale consists of 10-items in which participants

responded to questions regarding their own self-esteem on a four-point likert scale ranging from *strongly agree* to *strongly disagree*. The scoring range was from zero (indicating low self-esteem) to 30 (indicating high self-esteem). Cronbach's alpha for reliability is .83 (Rosenberg, 1965). For this sample, Cronbach's alpha was .87.

Self-regulation.

The Adult Temperament Questionnaire (ATQ)- Effortful Control Scale. The effortful control scale of the Adult Temperament Questionnaire (ATQ) was used to measure self-regulation (Derryberry & Rothbart, 1988). The ATQ is a temperament scale that consists of four general constructs including: effortful control, negative affect, extraversion/surgency, and orienting sensitivity. Each of the general constructs are referred to as factor scales. Each of the four factor scales are comprised of main scales or sub-constructs (Derryberry & Rothbart, 1988). For the purposes of this study however, only the effortful control scale was utilized. Effortful control is a temperament construct that encompasses the executive attention system and includes one's ability to inhibit unsuitable behaviour. The effortful control scale contains three sub-constructs which include activation control, effortful attention, and inhibitory control (Evans & Rothbart, 2007).

The effortful control scale consists of 18-items⁵ in which the participant was to indicate how "*true*" each statement is for them. Statements included items such as *I am often late for appointments* and *when I am trying to focus my attention, I am easily distracted*. Responses were rated on a seven point scale ranging from *extremely untrue* to *extremely true*. Cronbach's alpha's for the scale range from .66 to .88 (Evans & Rothbart,

⁵ The original scale consists of 19 items. Due to an error, item number 19 was not included in the data collection procedure.

2007); for this sample, Cronbach's alpha was .70. The ATQ has been validated in samples of young people ages 18 and older (Derryberry & Rothbart, 1988).

Data Preparation

Gambling classifications. A broad classification of gambling behaviour was used in this study. Supported by previous research, the classification was based on the SOGS score obtained, in addition to the frequency in which the participant participated in various gambling activities (Chalmers & Willoughby, 2006; Poulin, 2000).

Present study participants were classified into one of three levels of gambling risk severity. All participants were either classified as low-risk, at-risk, or high-risk gamblers based on their SOGS score as well as their gambling participation frequency. Low-risk gamblers were those participants who indicated that they gambled less than weekly and who had a SOGS score of zero to two (Jacques & Ladouceur, 2006). At-risk gamblers were those individuals who indicated that they gambled weekly (Chalmers & Willoughby, 2006) and who had a SOGS score of zero to two (Jacques & Ladouceur, 2006), OR who indicated gambling less than weekly (no more than two to three times a month) (Chalmers & Willoughby, 2006) with a SOGS score of three or four (Jacques & Ladouceur, 2006). Finally, high-risk gamblers were those participants who had a SOGS score of five or more regardless of gambling frequency (Jacques & Ladouceur, 2006), OR who indicated gambling on a daily basis regardless of SOGS score (Chalmers & Willoughby, 2006), OR who gambled at least weekly (Chalmers & Willoughby, 2006) with a SOGS score of three or four.

Data cleaning. To prepare data for final analysis, certain measures were taken to ensure accuracy. In order to ensure the quality of data, an examination of each survey

was conducted prior to analysis. In particular, surveys were examined to identify any surveys that were not filled out truthfully. Surveys were scanned to see if a variability in responses was absent on any of the scales. The majority of scales represented in the survey (67%) had reverse-coded items and therefore variability in responses was expected. After final evaluation, no surveys were removed as it appeared that all surveys were filled out truthfully and accurately.

Treatment of missing data. Only very minimal amounts of data were missing (0.27%), however, in order to deal with missing data, the expectation-maximization (EM) algorithm was utilized to impute missing values. The EM algorithm is a broad iterative procedure that computes maximum likelihood estimates when there is incomplete or missing data (Lagendijk, Biemond, & Boeke, 1990). The EM algorithm involves two precise steps: first there is the expectation step, followed by the maximization step (Dempster, Laird, & Rubin, 1977; Enders, 2001). In the expectation step, missing data is replaced with the “conditional expectation of the missing data given the observed data and an initial estimate of the covariance matrix” (Enders, 2001, p. 136). In other words, missing data is replaced with conditional means and covariance’s based on the correctly entered data and parameter estimates of the given data. In the maximization step, maximum likelihood estimates of the mean and covariance matrix are acquired using the statistics calculated beforehand during the expectation process (Enders, 2001). The EM algorithm has become increasingly common in research as its theoretical benefits are extensively recognized. The EM algorithm is believed to be preferred to previously used missing data analyses such as listwise and pairwise deletion methods (Enders, 2001). To

confirm results, all analyses were run with and without imputed data. The pattern of results was the same for all analyses.

Plan for Analysis

In order to address the two aforementioned research questions, a one-way analysis of variance (ANOVA)⁶ was utilized in order to observe group differences among the three gambling severity classifications on all measures. Non-parametric tests (Kruskal-Wallis) were employed for those items that did not meet the assumption of homogeneity of variance (i.e., a significant finding on Levene's Test for Homogeneity). The Kruskal-Wallis is the non-parametric alternative to the one-way analysis of variance that utilizes rank sums rather than means to uncover group differences (Hill & Lewicki, 2006). The Kruskal-Wallis is employed when there are three or more independent groups (Gravetter & Wallnau, 2007) and was therefore the most appropriate non-parametric test for the current study. In the event a non-parametric test was utilized, the results were crosschecked with the original ANOVA results. The pattern of results was consistent throughout and therefore only ANOVA results were reported.

Post hoc tests were conducted when necessary using Tukey HSD to determine the pairwise differences among the means for parametric analyses (ANOVA). Tukey HSD is one of the most commonly executed post hoc tests in the psychological sciences. This test computes a single value (this value is called honestly significant difference (HSD)) that determines the minimum amount of difference that is needed between the means to indicate significance (Gravetter & Wallnau, 2007). For the non-parametric analyses

⁶ To address the unequal group size, weights were added to each of the three groups. Weighting was done by choosing the "weight groups" option in SPSS. After the addition of the weights, sample sizes were as follows: low-risk, $n=51$, at-risk, $n=50$ and high-risk, $n=72$; $N=173$. Analyses were run with weighted and unweighted data and the pattern of results were consistent.

(Kruskal-Wallis), the Mann-Whitney test was used to determine pairwise group differences. The Mann-Whitney is a non-parametric version of the t-test for independent samples, similar to the Kruskal-Wallis, the Mann-Whitney test is based on rank sums rather than means. The Mann-Whitney test is the most powerful and therefore most sensitive non-parametric substitute for the independent sample t-test (Hill & Lewicki, 2006). An alpha level of .05 was used for all statistical tests.

Results

Correlations among Sex, Age, Gambling Classification, and all Scales

Correlation coefficients were computed for participants' sex, age, gambling classification, and all scales utilized in the current study (the SOGS, gambling frequency, the six HEXACO-PI scales, impulsivity and sensation seeking (ImpSS), self-esteem, and self-regulation). Correlations ranged from a low of .005 to a high of .891 (see Table 1). The variables with the strongest intercorrelations were the Emotionality and Honesty-Humility domains of the HEXACO-PI, gambling frequency, SOGS, and gambling classification. The Openness to Experience domain of the HEXACO-PI and self-esteem had the weakest correlations (see Table 1).

Gambling Activities

Correlations among gambling activities. Correlation coefficients were computed among the 18 gambling activities. Correlations ranged from -.198 to .752 (see Table 2). The most highly correlated items were playing games of skill (i.e., Pool or darts) for money, playing cards or board games with family or friends for money, betting on sports teams, and playing card or dice games at the casino (see Table 2). These

Table 1

Intercorrelations between Sex, Age, Gambling Classification, and all Scales

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Participants sex	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Participants age	.382**	-	-	-	-	-	-	-	-	-	-	-	-
3. SOGS score	-.393**	.167	-	-	-	-	-	-	-	-	-	-	-
4. Gambling frequency score	-.558**	.289**	.640**	-	-	-	-	-	-	-	-	-	-
5. Gambling classification	-.466**	.229*	.891**	.736**	-	-	-	-	-	-	-	-	-
6. Honesty-Humility score	.343**	-.105	-.332**	-.313**	-.348**	-	-	-	-	-	-	-	-
7. Emotionality score	.610**	-.236*	-.274**	-.300**	-.267**	.220*	-	-	-	-	-	-	-
8. Extraversion score	-.152	.058	.022	.054	-.030	-.032	-.219*	-	-	-	-	-	-
9. Agreeableness score	.010	.018	-.136	-.052	-.141	.269**	.064	.124	-	-	-	-	-
10. Conscientiousness score	.258**	.035	-.231*	-.200*	-.217*	.219*	.409**	.135	-.014	-	-	-	-
11. Openness to Experience score	.005	-.015	.041	-.062	-.057	.010	-.029	.145	-.023	.026	-	-	-
12. IMPSS score	-.129	-.027	.253*	.239*	.236*	-.267**	-.363**	.310**	-.119	-.491**	.107	-	-
13. Self-esteem score	.200*	-.266*	.110	.126	.127	-.035	.164	-.607**	.098	-.219*	-.132	-.075	-
14. Self-regulation score	.081	.066	-.359**	-.216*	-.341**	.291**	.005	.222*	.255*	.558**	.107	-.324**	.123

Note. $N = 100$. * $p < .05$, ** $p < .01$.

Table 2

Intercorrelations between Items on the Gambling Frequency Scale

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Played the lottery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Instant win/scratch tickets	.510**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3. Raffle/fundraising tickets	.261**	.286**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4. Break open/pull tab ticket	.349**	.499**	.160	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5. Sports Select/Pro-line	.312**	.153	.147	.300**	-	-	-	-	-	-	-	-	-	-	-	-	-
6. Bingo	.084	.131	.147	.101	-.086	-	-	-	-	-	-	-	-	-	-	-	-
7. Reality TV outcomes	.068	.184	.224*	.260**	.087	.239*	-	-	-	-	-	-	-	-	-	-	-
8. Cards/board games for money	.107	.004	.185	.192	.251*	.323**	.405**	-	-	-	-	-	-	-	-	-	-
9. Games of skill	.264**	.169	.133	.108	.356**	.118	.300**	.630**	-	-	-	-	-	-	-	-	-
10. Arcade/video games	-.147	-.045	.088	-.057	.069	.154	.091	.410**	.330**	-	-	-	-	-	-	-	-
11. Bet on the internet	.070	.018	-.114	.026	.339**	-.078	.044	.328**	.365*	.345**	-	-	-	-	-	-	-
12. Flipped coins/played dice	.124	.034	.152	.122	.235*	-.025	.380**	.316**	.243*	.055	.312**	-	-	-	-	-	-
13. Slot/gambling machines	.352**	.372**	-.022	.363**	.343**	-.007	-.083	.146	.177	.167	.265**	.059	-	-	-	-	-
14. Sport teams	.269**	.005	.133	.080	.752**	-.053	.080	.280**	.389**	.065	.443**	.227**	.314**	-	-	-	-
15. Horse races	.052	-.026	.014	.013	.237*	.031	.102	.191	.271**	-.011	.079	.349**	.185	.200*	-	-	-
16. Card/dice games at casino	.168	-.001	.071	.163	.642**	-.198*	-.135	.259**	.308**	.163	.425**	.337**	.312**	.516**	.463**	-	-
17. Bet with a bookie	-.090	-.044	-.114	-.041	-.047	-.075	.154	.083	.038	-.032	-.046	.106	-.067	-.047	-.031	-.047	-
18. Bet on other	.049	-.142	.159	-.136	-.717	.237*	.086	.079	.131	.259**	.032	.099	-.129	-.048	.444	-.091	.007

Note. $N = 100$. * $p < .05$, ** $p < .01$.

findings suggest that if young people participate in these gambling activities, they tend also to participate in most other gambling activities.

Overall prevalence of gambling activity frequency. A composite measure of gambling frequency was computed by averaging the reported amount of gambling activity participation. On average, adolescents reported infrequent gambling participation with a gambling activity participation frequency between “never in the past year” and “one to five times in the past year” ($M = 1.59$, $SD = 0.49$). The range of frequency on individual gambling items was from 0.96 (never in the past year) to 2.7 (between one to five times in the past year and six to 11 times in the past year). The gambling activity most frequently participated in was playing instant win or scratch tickets ($M = 2.7$, $SD = 1.61$).

Overall gambling activity frequency by sex and age. Using the gambling frequency composite, a one-way ANOVA test was employed to examine differences in overall gambling frequency between males and females and among the different ages. Results indicated that there was a significant difference between the average gambling activity participation for males and females, $F(1, 171) = 82.09$, $p < .001$. In particular, males reported significantly higher gambling frequency averages ($M = 1.98$, $SD = 0.54$) than females ($M = 1.40$, $SD = 0.33$). With regards to age, a one-way ANOVA test indicated that a significant difference existed between the gambling activity participation frequencies among the different age groups $F(7, 165) = 4.00$, $p < .001$. Specifically, older participants (aged 23 and 24) reported the highest gambling frequency averages ($M = 1.95$, $SD = 0.78$; $M = 1.78$, $SD = 0.62$, respectively), while the youngest participants

(aged 17 and 18) reported the lowest gambling frequency averages ($M = 1.33$, $SD = 0.22$; $M = 1.45$, $SD = 0.44$, respectively).

Prevalence of individual gambling activity frequency. The gambling activity most commonly reported was playing instant-win or scratch tickets with 77% of the sample indicating they participated in this activity at least one to five times in the past year. The second most commonly reported gambling activity was buying raffle or fundraising tickets (72%), followed by playing the lottery (65%). The gambling activity least reported was betting on sports with a bookie, with only one percent of the sample indicating they had participated in this activity in the past year.

Prevalence of individual gambling activity frequency by sex. The gambling activity most commonly played by male adolescents was betting or gambling on the internet ($M = 3.62$, $SD = 2.52$) (between 6 times a year and once a month) followed by playing the lottery ($M = 3.01$, $SD = 1.77$) (6 to eleven times in a year). For females, the most commonly played gambling activity was playing instant-win or scratch tickets ($M = 3.30$, $SD = 1.87$) (about 6 to eleven times a year), followed by playing the lottery ($M = 2.20$, $SD = 1.29$) (about 1 to 5 times in the past year). See Table 3 for a full list of activities by sex.

A one-way ANOVA procedure was utilized in order to examine differences in the prevalence rates of gambling activities between males and females. Significant differences were found between males and females on several activities. Specifically, males reported significantly higher participation rates for playing the lottery, $F(1, 17) = 12.31$, $p < .001$, playing Sports Select or Pro-line, $F(1, 171) = 72.89$, $p < .001$, playing card or board games with friends or family for money, $F(1, 171) = 20.29$, $p <$

Table 3

Individual Gambling Activities by Sex

Activity	Males		Females	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Played the Lottery	3.01	1.77	2.20	1.29
Instant win/scratch tickets	2.75	1.70	3.30	1.87
Raffle/fundraising tickets	1.97	1.06	2.09	0.88
Break open/pull tab ticket	1.42	1.20	1.43	0.79
Sports Select/Pro-line	3.29	2.34	1.17	0.56
Bingo	1.47	0.90	1.66	0.72
Reality TV outcomes	1.55	0.90	1.63	1.31
Cards/board games for money	2.65	1.48	1.74	1.18
Games of skill	2.43	1.45	1.39	0.97
Arcade/video games	1.45	1.09	1.11	0.32
Bet on the internet	3.62	2.52	1.10	0.31
Flipped coins/played dice	1.57	0.98	1.22	0.74
Slot/gambling machines	1.99	0.98	1.52	0.93
Sport teams	2.88	1.93	1.11	0.35
Horse races	1.34	0.70	1.09	0.39
Card/dice games at casino	2.44	1.45	1.06	0.24
Bet with a bookie	1.00	0.00	1.02	0.14
Bet on Other	1.06	0.96	0.93	0.30

Note. *N* = 100.

.001, playing games of skill (i.e. darts, pool) for money $F(1, 171) = 32.11, p < .001$, betting or gambling on the internet, $F(1, 171) = 73.94.05, p < .001$, flipping coins or playing dice for money, $F(1, 171) = 7.26, p = .008$, playing slot or poker machines, $F(1, 172) = 10.25, p = .002$, betting on sports teams, $F(1, 171) = 77.81, p < .001$, betting on horse races, $F(1, 171) = 8.46, p = .004$, and playing card or dice games at the casino, $F(1, 171) = 84.41, p < .001$.

Females reported significantly higher participation rates for playing instant win or scratch tickets, $F(1, 172) = 3.98, p = .048$. There were no significant sex differences for buying raffle or fundraising tickets, playing break open or pull tabs, playing bingo, betting on TV show outcomes, playing arcade or video games for money, betting on sports with a bookie, or betting money or objects on another game or activity that was not listed.

Gambling consequences

Overall prevalence of gambling consequences. A measure of gambling consequences was calculated by obtaining the total number of gambling consequences one had experienced using the SOGS measure. Overall, 20% of the sample reported experiencing at least one gambling related consequence in the past year, while on average, participants aged 17 to 24 reported experiencing between two and three gambling related consequences in the past year ($M = 2.63, SD = 2.46$).

Overall prevalence of gambling consequences by sex and age. Using the gambling consequences measure, a one-way ANOVA test was employed to examine the difference in overall gambling consequence frequency between males and females and among participants of different ages. Results indicated that there was a significant

difference between the sexes for the number of consequences experienced

$F(1, 171) = 56.95, p < .001$. In particular, males reported experiencing significantly more gambling related consequences ($M = 4.21, SD = 3.10$) than females ($M = 1.82, SD = 1.55$).

To explore age differences, a one-way ANOVA test indicated that a significant difference existed between the amount of gambling related consequences experienced by participants of different ages $F(7, 165) = 5.23, p < .001$. Specifically, participants 23 years of age reported experiencing the highest number of gambling consequences ($M = 4.71, SD = 3.99$), while participants 18 years of age reported experiencing the lowest number of gambling related consequences ($M = 1.97, SD = 1.88$). See Table 4 for a full list of differences among age groups.

Prevalence of individual gambling consequences. The most frequently reported gambling consequences were going back to win money that had been lost (46%), arguing with people about how to handle money (38%), and gambling more than intended (34%). The least frequently reported gambling consequences were borrowing money for gambling and not paying it back (3%) and having money arguments centred on gambling (3%). When asked about the borrowing of money to gamble or paying back gambling debts, the most commonly reported sources of money were from relatives, in-laws, or friends (11%) and from a chequing account (10%). The least commonly reported sources of money were from loan sharks (0%), by cashing in stocks, bonds, or securities, and by selling personal property (each 1%).

Prevalence of individual gambling consequences by sex. A one-way ANOVA procedure was utilized in order to examine sex differences in the prevalence rates of

Table 4

Mean Score on the Gambling Consequences Measure by Age

Age	<i>n</i>	<i>M</i>	<i>SD</i>
17	7	2.00	1.41
18	33	1.97	1.88
19	14	2.79	1.89
20	8	2.25	2.19
21	12	4.00	3.46
22	10	2.70	2.21
23	7	4.71	3.99
24	9	2.11	2.47

Note. *N* = 100.

experiencing individual gambling related consequences. Several significant differences were found between males and females. Specifically, males reported significantly higher experiences of gambling related consequences such as trying to win back money lost, $F(1, 171) = 16.18, p < .001$, claimed to be winning money at gambling when they were not, $F(1, 171) = 7.67, p = .006$, feelings of having a problem with gambling, $F(1, 171) = 15.42, p < .001$, gambling more than intended, $F(1, 172) = 23.33, p < .001$, having been criticized about gambling, $F(1, 171) = 23.28, p < .001$, feeling guilty about gambling, $F(1, 171) = 6.90, p = .009$, and losing time from work or school due to

gambling, $F(1, 171) = 40.78, p < .001$. There were no significant gender differences for hiding betting slips or gambling money from important people, arguing with people your living with over the handling of money, having money arguments about gambling, and borrowing money from someone and not paying them back as a result of gambling.

With regards to the borrowing of money for gambling, significant differences were similarly found between males and females. Males reported significantly more instances of borrowing money through methods such as from relatives, in-laws, or friends, $F(1, 171) = 6.04, p = .015$, from credit cards, $F(1, 171) = 10.69, p = .001$, from banks, loan companies, or credit unions, $F(1, 172) = 4.17, p = .043$, and from a chequing account, $F(1, 171) = 10.29, p = .002$. There were no significant sex differences for borrowing money from household or rent money, from a spouse or girlfriend/boyfriend, from loan sharks, by cashing in stocks, bonds, or other securities, or by selling personal or family property.

Gambling Classifications

All participants ($N = 100$) were classified into one of three gambling classifications: low-risk, at-risk, or high-risk gamblers. Participants who indicated that they gambled less than weekly and who had a SOGS score of zero to two were classified as low-risk gamblers ($n = 51$). Individuals who indicated that they gambled weekly and who had a SOGS score of zero to two, or who indicated gambling less than weekly with a SOGS score of three or four were classified as at-risk gamblers ($n = 25$). And finally, participants who had a SOGS score of five or more regardless of gambling frequency, or who indicated gambling on a daily basis regardless of SOGS score, or who gambled at

least weekly with a SOGS score of three or four were classified as high-risk gamblers ($n = 24$).

Gambling classification and age differences. The majority of low-risk gamblers were 18 years of age (63.6% of all 18 year olds), while the majority of at-risk gamblers were 20 years of age (50% of all 20 year olds) and finally, most of the high-risk gamblers in the sample were 23 years of age (57.1% of all 23 year olds). There were no participants 17 years of age classified in the high-risk category and no 21 or 24 year old participants classified as at-risk gamblers. See Table 5 for a full list of gambling classifications by age.

A one-way ANOVA revealed significant differences between the participant's age and their classification. Specifically, results indicated a significant main effect for participants age and gambling classification with high-risk gamblers being the oldest followed by low-risk gamblers, and lastly, with at-risk gamblers being the youngest. Post hoc analysis indicated significant differences between low-risk and high-risk gamblers and between at-risk and high-risk gamblers. No significant findings were noted for low-risk and at-risk gamblers (see Table 6).

Overall gambling activity frequencies by classification. To assess the overall differences in the frequency of gambling participation among the three groups of gamblers, the composite gambling score was utilized. Descriptive results revealed that overall, low-risk gamblers gambled at a lower frequency ($M = 1.31$, $SD = 0.25$) than at-risk gamblers ($M = 1.55$, $SD = 0.33$), who subsequently had lower gambling frequencies than high-risk gamblers ($M = 2.23$, $SD = 0.45$). Specifically, the means indicated that on average, most low-risk gamblers had not gambled in the past year, with some gambling

Table 5

Gambling Classification Distribution by Age

Age	Low-risk		At-risk		High-risk	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
17	4	57.1	3	42.9	0	0.0
18	21	63.6	8	24.2	4	12.1
19	5	35.7	6	42.9	3	21.4
20	3	37.5	4	50.0	1	21.5
21	6	50.0	0	0.0	6	50.0
22	5	50.0	3	30.0	2	20.0
23	2	28.6	1	14.3	4	57.1
24	5	55.6	0	0.0	4	44.4

Note. *N* = 100.

Table 6

Gambling Classification Differences by Age

	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Age	19.67a (2.21)	19.12a (1.65)	21.13b (2.08)	16.54	2,170	<.001

Note. $N = 173$ (for the weighted analyses). Subscripts indicate significant group differences.

no more than five times in the past year. With regards to at-risk gamblers, they gambled approximately one to five times in the past year, while high-risk gamblers reported gambling at least one time in the past year but some reported gambling up to 11 times on average in the past year.

Individual gambling activity frequencies by classification. A one-way ANOVA was used in order to see if differences existed in the frequencies of participation in various gambling activities among the three gambling classifications (low-risk, at-risk, and high-risk gamblers). Significant main effects were found for 13 gambling activities (see Table 7). Post hoc analyses were carried out to determine differences among the group means. A significant main effect was found for playing instant-win or scratch tickets. Post hoc analyses revealed that low-risk gamblers played significantly less than at-risk and high-risk gamblers. No significant differences were found between at-risk and high-risk gamblers however (see Table 7). A significant main effect was also noted for buying raffle or fundraising tickets, betting on television show outcomes, and playing

Table 7

Gambling Activity Differences by Classification

Gambling Activity	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Played the lottery	1.80a (1.80)	2.04a (2.04)	3.46b (3.46)	26.62	2,170	<.001
Played instant win/scratch tickets	2.00a (2.00)	3.08b (3.08)	3.79b (3.79)	17.35	2,170	<.001
Raffle/fundraising tickets	1.82a (1.82)	1.96ab (1.96)	2.25b (2.25)	3.23	2,170	.042
Break open or pull tabs	1.18a (1.18)	1.44a (1.44)	1.58a (1.58)	2.59	2,170	.078
Bet on Sports Select/Pro-line	1.22a (1.22)	1.40a (1.40)	3.25b (3.25)	28.49	2,170	<.001
Played Bingo	1.45a (1.45)	1.50a (1.80)	1.80a (1.50)	2.91	2,170	.057
Bet on TV show outcomes	1.24a (0.43)	1.72ab (1.36)	1.75b (1.28)	3.60	2,170	.029
Played cards/games for money	1.62a (0.94)	2.04ab (1.29)	2.58b (1.59)	7.81	2,170	.001
Played games of skill for money	1.16a (0.46)	1.56a (0.76)	2.54b (1.64)	23.24	2,170	<.001
Played arcade games for money	1.10a (0.30)	1.28a (0.67)	1.38a (1.04)	1.89	2,170	.154
Bet/gambled on the internet	1.14a (0.49)	1.56a (1.37)	3.46b (2.57)	28.52	2,170	<.001
Flipped coins/played dice for money	1.10a (0.30)	1.12a (0.33)	1.75b (1.21)	12.97	2,170	<.001
Played slot/gambling machines	1.37a (0.56)	1.52a (1.11)	2.13b (0.98)	11.76	2,170	<.001
Bet on sports teams	1.18a (0.78)	1.24a (0.431)	2.88b (2.02)	32.01	2,170	<.001
Bet on horse races	1.04a (0.52)	1.18a (0.20)	1.38b (0.70)	6.50	2,170	.002
Played games at the casino	1.16a (0.37)	1.20a (0.49)	2.38b (1.53)	27.59	2,170	<.001
Bet on sports with a bookie	1.00a (0.00)	1.04a (0.198)	1.00a (0.00)	2.52	2,170	.084
Bet on anything not listed	0.92a (0.44)	0.92a (0.27)	1.08a (0.96)	1.20	2,170	.305

Note. *N* = 173 (for the weighted analyses). Subscripts indicate significant group differences.

cards or board games for money. Post hoc analyses revealed that low-risk gamblers played significantly less than high-risk gamblers. No significant differences were found between low-risk and at-risk gamblers or between at-risk and high-risk gamblers (see Table 7).

The remaining nine items with significant main effects included playing the lottery, playing Sports Select or Pro-line, playing games of skill for money, betting on the internet, playing coins/dice games for money, playing slot or poker machines, betting on sports teams, betting on horse races, and playing card or dice games at the casino. Each post hoc test revealed that significant group differences existed between low-risk and high-risk gamblers and between at-risk and high-risk gamblers with low-risk gamblers reporting the lowest group means and high-risk gamblers reporting the highest group means (see Table 7). No other significant main effects were found however, with the exception of betting on sports with a bookie (at-risk gamblers reported the highest involvement), linear trends were noted where the high risk gamblers reported the highest involvement in each gambling activity (see Table 7).

Gambling classification and sex differences. Of the 34 male participants, nine were classified as low-risk gamblers (26.5%), seven were classified as at-risk gamblers (20.6%), and 18 (52.9 %) were considered high-risk gamblers. Forty-two of the 66 female participants were classified as low-risk gamblers (63.6%), 18 were considered at-risk gamblers (27.3%), and six were classified as high-risk gamblers (9.1%).

Sex and overall gambling activity frequency. A one-way ANOVA examined differences in the overall gambling participation frequency between males and females among the three different gambling classifications. Results indicated that there was a

Table 8

Overall Gambling Frequency by Sex

Gender	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Male	1.56a (0.31)	1.56a (0.31)	2.34b (0.42)	31.69	2,74	<.001
Female	1.26a (0.20)	1.55b (0.33)	1.91c (0.35)	34.87	2,93	<.001

Note. $N = 173$ (for the weighted analyses). Subscripts indicate significant group differences.

significant main effect for gambling participation frequency among low-risk, at-risk, and high-risk gamblers for both males and females (see Table 8). Post hoc analyses were conducted to determine differences among the group means. For males, post hoc analyses revealed that low-risk and at-risk gamblers were similar and both had significantly lower gambling participation rates than high-risk gamblers (see Table 8). For females, post hoc analyses revealed significant differences among the three gambling classifications with low-risk gamblers reporting the lowest participation rates and high-risk gamblers reporting the highest participation rates (see Table 8).

Sex and individual gambling activity frequency. To examine sex differences in individual activity frequencies, a one-way ANOVA was employed. Significant main effects were found for both males and females. Specifically, results indicated that there was a significant difference in the individual gambling activity participation among low-risk, at-risk, and high-risk male gamblers for playing the lottery, playing Sports Select

and/or Pro-line, betting or gambling on the internet, flipping coins or playing dice games for money, playing slot or poker machines, betting on sports teams, and playing card or dice games at the casino (see Table 9).

Post hoc analyses revealed significant differences between high-risk and low-risk and between high-risk and at-risk male gamblers for playing Sports select and/or pro-line, and betting on sports teams with low-risk gamblers reporting the lowest gambling activity frequency. There were no noted significant differences between at-risk and low-risk gamblers. With regards to playing dice or card games at the casino, significant differences were found between at-risk and high-risk gamblers with high-risk gamblers reporting the highest gambling participation (see Table 9). No significant differences were found between low-risk and at-risk or low-risk and high-risk gamblers. Finally, significant differences were found between low-risk and high-risk gamblers for betting or gambling on the internet. Although a significant main effect was noted for flipping coins/playing dice games for money, post hoc analyses did not indicate any further group differences (see Table 9).

For females, significant differences among the three gambling classifications were found for playing the lottery, playing instant win or scratch tickets, buying raffle or fundraising tickets, playing break open or pull tab tickets, playing bingo, betting on TV show outcomes, playing card or board games for money, playing games of skill for money, playing arcade or video games for money, betting and gambling on the internet, flipping coins or playing dice for money, and playing slot or poker machines (see Table 10).

Table 9

Gambling Frequencies for Males by Gambling Classification

Gambling Activity	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Played the lottery	2.00a (1.50)	2.43a (2.06)	3.33a (1.65)	3.33	2,74	.041
Played instant win/scratch tickets	2.11a (1.05)	2.00a (1.36)	3.06a (1.80)	3.01	2,74	.055
Raffle/fundraising tickets	1.78a (0.44)	1.57a (1.09)	2.11a (1.11)	1.63	2,74	.203
Break open or pull tabs	1.22a (0.44)	1.00a (0.00)	1.56a (1.40)	1.35	2,74	.267
Bet on Sports Select/Pro-line	1.78a (1.39)	1.71a (1.86)	3.94b (2.29)	8.61	2,74	<.001
Played Bingo	1.33a (0.50)	1.43a (0.51)	1.50a (1.02)	0.15	2,74	.864
Bet on TV show outcomes	1.44a (0.53)	1.14a (0.36)	1.67a (1.01)	2.01	2,74	.141
Played cards/games for money	1.67a (1.22)	2.57a (1.74)	2.67a (1.47)	0.02	2,74	.977
Played games of skill for money	1.67a (0.87)	2.00a (1.11)	2.67a (1.54)	2.71	2,74	.073
Played arcade games for money	1.22a (0.44)	1.43a (1.09)	1.50a (1.18)	0.25	2,74	.781
Bet/gambled on the internet	1.56a (1.01)	2.43ab (2.34)	4.28b (2.47)	7.50	2,74	.001
Flipped coins/played dice for money	1.22a (0.44)	1.00a (0.00)	1.78a (1.09)	4.54	2,74	.014
Played slot/gambling machines	1.56a (0.73)	1.57a (0.76)	2.17a (1.02)	3.22	2,74	.046
Bet on sports teams	1.56a (0.73)	1.57a (0.51)	3.44b (2.03)	9.37	2,74	<.001
Bet on horse races	1.22a (0.67)	1.00a (0.00)	1.44a (0.77)	2.47	2,74	.091
Played games at the casino	1.78ab (0.44)	1.57a (0.76)	2.78b (1.56)	5.53	2,74	.006
Bet on sports with a bookie	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)		2,74	
Bet on anything not listed	1.00a (0.71)	0.71a (0.47)	1.17a (1.08)	1.26	2,74	.291

Note. $n = 77$. Subscripts indicate significant group differences.

Table 10

Gambling Frequencies for Females by Gambling Classification

Gambling Activity	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Played the lottery	1.76a (0.73)	1.89a (1.12)	3.83b (1.38)	26.62	2,93	<.001
Played instant win/scratch tickets	1.98a (0.78)	3.50b (1.48)	6.00c (1.89)	17.35	2,93	<.001
Raffle/fundraising tickets	1.83a (0.49)	2.11a (1.06)	2.67b (0.97)	3.23	2,93	.003
Break open or pull tabs	1.17a (0.44)	1.61ab (1.02)	1.67b (0.77)	2.59	2,93	.015
Bet on Sports Select/Pro-line	1.10a (0.43)	1.28a (0.74)	1.17a (0.38)	28.49	2,93	.362
Played Bingo	1.48a (0.59)	1.94b (0.86)	1.50a (0.51)	2.91	2,93	.009
Bet on TV show outcomes	1.19a (0.40)	1.94ab (1.53)	2.00b (1.88)	3.60	2,93	.015
Played cards/games for money	1.40a (0.70)	1.83ab (1.03)	2.33b (1.94)	7.81	2,93	.015
Played games of skill for money	1.05a (0.22)	1.39a (0.49)	2.17b (1.92)	23.24	2,93	<.001
Played arcade games for money	1.07ab (0.26)	1.22b (0.42)	1.00a (0.00)	1.89	2,93	.026
Bet/gambled on the internet	1.05ab (0.22)	1.22b (0.42)	1.00a (0.00)	28.52	2,93	.011
Flipped coins/played dice for money	1.07a (0.26)	1.17a (0.38)	1.67b (1.53)	12.97	2,93	.014
Played slot/gambling machines	1.33a (0.53)	1.50ab (1.23)	2.00b (0.84)	11.76	2,93	.037
Bet on sports teams	1.10a (0.37)	1.11a (0.32)	1.67a (0.38)	32.01	2,93	.773
Bet on horse races	1.10a (0.48)	1.06a (0.23)	1.17a (0.38)	6.50	2,93	.613
Played games at the casino	1.02a (0.15)	1.06a (0.23)	1.17a (0.38)	27.59	2,93	.111
Bet on sports with a bookie	1.00a (0.00)	1.06a (0.23)	1.00a (0.00)	2.52	2,93	.187
Bet on anything not listed	0.90a (0.37)	1.00a (0.00)	0.83a (0.38)	1.20	2,93	.126

Note. $n = 96$. Subscripts indicate significant group differences.

Post hoc analyses indicated significant differences between low-risk and high-risk and between at-risk and high-risk female gamblers for playing the lottery, buying raffle or fundraising tickets, playing games of skill for money, and flipping coins/playing dice games for money with high-risk gamblers reporting the highest participation and low-risk gamblers reporting the lowest participation. There was no significant difference between the low-risk and at-risk gamblers.

Significant differences between low-risk and high-risk gamblers were noted for playing break open or pull tab tickets, betting on TV show outcomes, playing cards or board games for money, and playing slot or gambling machines with the high-risk gamblers reporting the highest level of participation. The at-risk gamblers were similar to both the low-risk and high risk gamblers.

For at-risk and high-risk gamblers, differences were found for playing arcade or video games for money and betting and gambling on the internet with at-risk gamblers reporting the greatest level of participation. There were no significant differences between the low-risk and high-risk gamblers or low-risk and at-risk gamblers.

Finally, significant differences were found among all three gambling classifications for playing instant-win or scratch tickets with low-risk gamblers reporting the lowest participation and high-risk gamblers indicating the highest participation (see Table 10).

Gambling and Personality Differences

HEXACO personality domains.

Overall descriptive statistics for the HEXACO personality scale by gambling classification. Examination of the means revealed that for five of the six HEXACO-PI

domains (Honesty-Humility, Emotionality, Extraversion, Agreeableness, and Conscientiousness) low-risk gamblers reported the highest group means. Specifically, expected linear trends were evident for the Honesty-Humility domain, the Emotionality domain, and the Conscientiousness domain with low-risk gamblers reporting the highest group means and high-risk gamblers reporting the lowest group means (high-risk gamblers therefore had lower levels of altruism, empathy, and emotional attachment to others (Emotionality), were less likely to be fair and true when engaging with others (Honesty-Humility), and were less likely to be engaged in task oriented activities such as organization or planning (Conscientiousness) (see Table 11).

This pattern was not consistent with the Agreeableness and Extraversion domains however, as at-risk gamblers demonstrated the lowest mean scores (less likely to forgive and had less tolerance for others (Agreeableness) and tended to have less engagement in social events and lower levels of personal satisfaction (Extraversion), followed by high-risk gamblers who had scores between those of low-risk and at-risk gamblers (see Table 11)⁷.

Findings for the Openness to Experience domain demonstrated that at-risk gamblers reported the highest means scores, followed by low-risk gamblers, with high-risk gamblers reporting the lowest mean scores (low scores indicated that individuals were not likely to be very open to learning or to new experiences) (see Table 11).

Personality profiles based on the HEXACO Personality Inventory were examined using a one-way ANOVA. Results indicated that significant main effects existed among the three classifications of gamblers on the Conscientiousness, the Emotionality, and the

⁷ Further analyses were only run for those domains that were significantly correlated with the gambling variables (see Table 1). Domains however, that were uncorrelated but had facet level scales with significant correlates, were included in further analyses (see Appendix E to J).

Table 11

Overall HEXACO Personality Domains by Classification

HEXACO Domain	M (SD)			F	df	p
	Low-risk	At-risk	High-risk			
Openness to Experience	3.17a (0.59)	3.21a (0.51)	3.08a (0.70)	0.80	2,170	.453
Conscientiousness	3.65a (0.62)	3.41ab (0.43)	3.34b (0.72)	3.86	2,170	.023
Extraversion ^a	3.58 (0.52)	3.48 (0.49)	3.56 (0.59)			
Agreeableness ^a	3.09 (0.50)	2.86 (0.56)	2.91 (0.66)			
Emotionality	3.64a (0.63)	3.52a (0.59)	3.20b (0.62)	8.28	2,170	<.001
Honesty-Humility	3.28a (0.53)	3.18a (0.50)	2.78b (0.53)	16.06	2,170	<.001

Note. N = 173 (for the weighted analyses). Subscripts indicate significant group differences.

^aNo further analyses were conducted on the Extraversion or Agreeableness variables as they were not correlated with the gambling variables (see Table 1).

Honesty-Humility HEXACO domains with high-risk gamblers reporting the lowest scores and low-risk gamblers reporting the highest scores. The Openness to Experience domain yielded non-significant results and therefore differences with this personality scale were not evident among low-risk, at-risk, and high-risk gamblers (see Table 11).

Post hoc analyses revealed that a significant difference existed between low-risk and high-risk gamblers on the Conscientiousness domain with high-risk gamblers showing significantly lower scores than low-risk gamblers. For the Emotionality and Honesty-Humility domains, significant differences were noted between low-risk and high-risk gamblers and between at-risk and high-risk gamblers. High-risk gamblers

demonstrated the lowest means followed by at-risk gamblers and subsequently, low-risk gamblers reported the highest scale means. Low-risk and high-risk gamblers differed by less than one standard deviation unit on all domains indicating little variance between the scores (see Table 11).

Honesty-humility domain. To examine gambling group differences for the Honesty-Humility HEXACO domain and its four facet level scales, a one-way ANOVA was used. Results indicated that overall there was a significant main effect for the Honesty-Humility domain as noted above and as originally hypothesized (see Table 11). Consequently, a similar pattern of results was found when examining the four facet level scales. Specifically, significant main effects were noted for the Fairness facet scale, the Greed Avoidance facet scale, and the Modesty facet scale. Significant findings were not evident for the Sincerity facet scale (see Table 12).

Post hoc analyses were conducted to examine mean differences among the three gambling classifications (low-risk, at-risk, and high-risk gamblers). Findings demonstrated that significant differences were evident between low-risk and high-risk gamblers and between at-risk and high-risk gamblers on the Fairness and Greed Avoidance facet scales. No significant differences were noted between at-risk and low-risk gamblers. For the Modesty facet scale, significant differences were found between low-risk and high-risk gamblers.

For the Fairness and Modesty facet scales, high-risk gamblers reported the lowest scale means (more willing to gain by cheating and more likely to consider themselves entitled to privileges and superior to others) while low-risk gamblers reported the highest

Table 12

Honesty-Humility HEXACO Domain

Facet	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Sincerity	3.21a (0.69)	3.15a (0.64)	2.94a (0.63)	2.95	2,170	.055
Fairness	3.53a (0.91)	3.33a (0.95)	2.85b (0.77)	9.99	2,170	<.001
Greed Avoidance	2.65a (0.81)	2.66a (0.85)	2.10b (0.70)	10.40	2,170	<.001
Modesty	3.74a (0.78)	3.57ab (0.57)	3.24b (0.82)	7.16	2,170	.001

Note. $N = 173$ (for the weighted analyses). Subscripts indicate significant group differences.

scale means. For the Greed Avoidance facet scale however, high-risk gamblers similarly reported the lowest scale means (want to enjoy and display wealth and privilege), at-risk gamblers on the other hand, reported higher scale means than low-risk gamblers who reported scale means between those of high and at-risk gamblers. For this domain, low-risk and high-risk gamblers differed by nearly one standard deviation (see Table 12). These findings supported the initial hypothesis that high-risk gamblers would produce lower scores on the Honesty-Humility Domain of the HEXACO-PI, particularly on the Fairness and Greed Avoidance facets, than low or at-risk gamblers.

Conscientiousness domain. Group differences were similarly examined for the Conscientiousness domain of the HEXACO Personality Inventory and its four facet level

scales (Organization, Diligence, Perfectionism, and Prudence). A one-way ANOVA was implemented to examine main effects. Results indicated significant main effects for the overall Conscientiousness domain (see Table 11) and the Prudence facet scale. Main effects were not found for the Organization facet scale, the Diligence facet scale, or for the Perfectionism facet scale (see Table 13).

Post hoc analyses were conducted to examine where the differences resided within the three gambling classifications. Findings illustrated that significant differences were noted between low-risk and at-risk gamblers and between low-risk and high-risk gamblers on the Prudence facet scale with low-risk gamblers reporting the highest scale means (more impulse control), followed by high-risk gamblers, and finally, at-risk gamblers with the lowest scale means. Low-risk and high-risk gamblers differed by nearly one standard deviation unit (see Table 13).

These findings partially supported the initial hypothesis that high-risk gamblers would have lower scores on the Conscientiousness Domain of the HEXACO-PI, especially on the Prudence facet than low or at-risk gamblers. Although low-risk gamblers had the highest mean scores, at-risk gamblers had scores more similar to that of the high-risk gamblers. It was also hypothesized however that high-risk gamblers would have lower scores than at-risk and low-risk gamblers on the Diligence facet which measures self-discipline, although high-risk gamblers did report the lowest mean scores for this scale (lower levels of self-discipline) (high-risk, $M = 3.64$, $SD = 0.81$; at-risk, $M = 3.70$, $SD = 0.53$; low-risk, $M = 3.88$, $SD = 0.75$), these findings were not significant.

Table 13

Conscientiousness *HEXACO Domain*

Facet	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Organization	3.67a (0.88)	3.42a (0.89)	3.32a (0.87)	2.39	2,170	.095
Diligence	3.88a (0.75)	3.70a (0.53)	3.64a (0.81)	1.71	2,170	.184
Perfectionism	3.56a (0.78)	3.52a (0.70)	3.35a (0.78)	1.29	2,170	.279
Prudence	3.48a (0.70)	3.02b (0.62)	3.03b (0.91)	6.17	2,170	.003

Note. *N* = 173 (for the weighted analyses). Subscripts indicate significant group differences.

Therefore, the hypothesis that high-risk gamblers would have lower scores than at-risk and low-risk gamblers was not supported.

Emotionality. To observe group differences among low-risk, at-risk, and high-risk gamblers on the Emotionality domain of the HEXACO Personality Inventory and its four facet level scales (Fearfulness, Anxiety, Dependence, and Sentimentality), a one-way ANOVA was executed to observe main effects. Findings indicated significant main effects for the overall Emotionality domain (see Table 11) and all four facet level scales (Fearfulness, Anxiety, Dependence, and Sentimentality) (see Table 14).

In order to uncover differences among the three groups of gamblers, post hoc analyses were conducted. Results showed that significant differences were evident

Table 14

Emotionality *HEXACO Domain*

Facet	<i>M</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Fearfulness	3.36a (0.84)	3.26ab (0.86)	2.90b (0.87)	4.97	2,170	.008
Anxiety	3.82a (0.82)	3.87a (0.76)	3.38b (0.84)	7.06	2,170	.001
Dependence	3.64a (0.90)	3.33ab (0.95)	3.23b (0.82)	3.41	2,170	.036
Sentimentality	3.74a (0.80)	3.63ab (0.68)	3.32b (0.97)	4.14	2,170	.017

Note. $N = 173$ (for the weighted analyses). Subscripts indicate significant group differences.

between low-risk and high-risk gamblers for the Fearfulness facet, the Dependence facet, and the Sentimentality facet with high-risk gamblers reporting significantly lower scale means than low-risk gamblers (less likely to fear injury (Fearfulness), more likely to feel self-assured and not to accept help from others (Dependence), and less likely to feel emotion for others (Sentimentality)). With regards to the Anxiety facet, differences were noted between low-risk and high-risk gamblers as well as between at-risk and high-risk gamblers. At-risk gamblers reported the highest mean scores (more preoccupied by minor problems), followed by low-risk gamblers, while high-risk gamblers reported the lowest-mean scores. Low-risk gamblers and high-risk gamblers differed by nearly one standard deviation unit (see Table 14).

Openness to experience domain. When examining differences among the three classifications of gamblers on the Openness to Experience domain, no significant main effects were evident (see Table 11). When exploring facet level scales however, a one-way ANOVA revealed significant main effects were noted for the Aesthetic Appreciation facet of the Openness to Experience domain (see Table 15).

Post hoc analyses were conducted and revealed significant differences between low-risk and high-risk gamblers and between at-risk and high-risk gamblers on the Aesthetic Appreciation facet of the Openness to Experience domain. For this facet, low-risk and at-risk gamblers reported the highest scale means, while high-risk gamblers, reported the lowest scale means (see Table 15). See Appendix K for a full HEXACO-PI summary table.

Impulsivity and sensation seeking. To examine group differences in the occurrence of impulsivity and sensation seeking, a one-way ANOVA was utilized. Significant main effects were found for the impulsive sensation seeking scale and for the impulsivity scale. There were no significant main effects for the sensation seeking scale (see Table 16). Post hoc analyses were performed in order to examine differences among the three classifications of gamblers. Specifically, significant differences were evident between low-risk and high-risk gamblers for both the impulsive sensation seeking scale and the impulsivity scale with high-risk gamblers reporting the highest group means (higher levels of impulsive sensation seeking and impulsivity) and low-risk gamblers reporting the lowest group means (see Table 16).

These findings partially supported the initial hypothesis that high-risk gamblers would exhibit higher levels of sensation seeking and impulsivity than their low or at-risk

Table 15

Openness to Experience HEXACO Domain

Facet	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Aesthetic Appreciation	3.21a (0.85)	3.21a (0.74)	2.77b (0.99)	5.11	2,170	.007
Inquisitiveness	2.64a (0.87)	2.79a (0.86)	2.97a (0.97)	2.00	2,170	.138
Creativity	3.55a (0.87)	3.42a (0.86)	3.25a (0.99)	1.62	2,170	.202
Unconventionality	3.31a (0.60)	3.42a (0.53)	3.31a (0.76)	0.52	2,170	.596

Note. $N = 173$ (for the weighted analyses). Subscripts indicate significant group differences.

Table 16

Impulsive Sensation Seeking Classification Differences

Scale	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Overall Impulsive sensation seeking	8.06a (3.99)	10.08ab (4.43)	10.46b (5.03)	4.34	2,170	.013
Sensation seeking	6.25a (2.99)	7.64a (3.37)	7.54a (3.31)	3.03	2,170	.051
Impulsivity	1.80a (1.85)	2.44ab (1.51)	2.92b (2.31)	4.75	2,170	.010

Note. $N = 173$ (for the weighted analyses). Subscripts indicate significant group differences.

gambling peers. Results demonstrated that high-risk gamblers had higher levels of impulsivity as well as higher scores on overall impulsive sensation seeking. When examined on its own however, the sensation seeking trait could not differentiate among the three groups of gamblers.

Gambling and Self-esteem

When examining mean scores, at-risk gamblers reported the highest scores (higher self-esteem) followed by high-risk gamblers, with the lowest scores being reported by low-risk gamblers (see Table 17). These findings did not support the initial hypothesis that high-risk gamblers would exhibit lower self-esteem than their low or at-

Table 17

Self-esteem Classification Differences

Scale	<i>M (SD)</i>		
	Low-risk	At-risk	High-risk
Self-esteem	6.63 (4.68)	9.72 (5.16)	7.54 (3.43)

Note. $N = 100$.

risk gambling peers. No further analyses were conducted, as the self-esteem measure was not significantly correlated with the gambling measures (see Table 1).

Gambling and Self-regulation

Overall self-regulation. Also of interest was the examination of self-regulation and whether or not low-risk gamblers were better able to self-regulate than high-risk gamblers. In order to explore self-regulatory differences among the three gambling classifications, a one-way ANOVA was implemented. Results revealed a significant main effect for the overall self-regulation measure by gambling classification (see Table 18).

Post hoc analyses revealed that significant differences were found between low-risk and at-risk gamblers and between low-risk and high-risk gamblers. No significant differences were noted for at-risk and high-risk gamblers. As hypothesized initially, low-risk gamblers reported the highest scale means (higher ability to self-regulate), then at-risk and high-risk gamblers, with high-risk gamblers reporting the lowest scale means (lower ability to self-regulate) (see Table 18). Therefore, the hypothesis that low-risk and

Table 18

Self-regulation Classification Differences

Scale	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Overall self-regulation	4.40a (0.65)	3.94b (0.63)	3.90b (0.54)	12.01	2,170	<.001
Activation Control	4.59a (0.67)	4.31ab (0.69)	4.27b (0.70)	3.48	2,170	.033
Attentional Control	4.17a (1.12)	3.65b (1.08)	3.65b (1.04)	4.16	2,170	.017
Inhibitory Control	4.36a (0.82)	3.72b (0.88)	3.68b (0.48)	15.33	2,170	<.001

Note. *N* = 173 (for the weighted analyses). Subscripts indicate significant group differences.

at-risk gamblers would present a stronger ability to self-regulate than high-risk gamblers was partially supported. Although low-risk gamblers reported the lowest mean scores, at-risk gamblers were indistinguishable from high-risk gamblers as their mean scores were similar.

Activation control, attentional control, and inhibitory control. Self-regulation can be broken down into three different sub-components representing different aspects of the concept: activation control, attentional control, and inhibitory control. In order to examine each sub-component of the self-regulation scale, a one-way ANOVA was used to examine differences among low-risk, at-risk, and high-risk gamblers. Significant main effects were noted for all three self-regulation components (activation control, attentional control, and inhibitory control) (see Table 18).

Post hoc analyses were conducted in order to observe mean differences among the three gambling groups. Findings showed that for the activation control sub-component significant differences were noted between low-risk and high-risk gamblers, with low-risk gamblers reporting significantly higher mean scores than high-risk gamblers (higher levels of activation control). With regards to the attentional control and inhibitory control sub-components, results indicated that significant differences existed between low-risk and at-risk gamblers and between low-risk and high-risk gamblers with low-risk gamblers reporting the highest means (highest levels of attentional and inhibitory control), and high-risk gamblers reporting the lowest means (lowest levels of attentional and inhibitory control) (see Table 18).

Discussion and Implications

The purpose of the study was to examine the role of personality and self-regulation in the gambling behaviour participation of late adolescents and emerging adults. In particular, the present study: a) examined if certain personality traits were more prevalent in high-risk gamblers than in young people considered low or at-risk gamblers; and, b) to examine if the ability to self-regulate helped distinguish low-risk and high-risk gamblers. The discussion addresses each of these results as well as findings regarding gambling activity participation, consequence experiences, and differences in gambling activity frequency among the three classifications of gamblers.

Adolescent Gambling Behaviour and Consequences

Overall, the majority of late adolescents and emerging adults participated in some form of gambling activity but the overall frequency of gambling was quite low (reporting an average frequency of gambling participation between never and one to five times in

the past year). These findings were consistent with previous research that has noted that the majority of young people (up to 80%) gamble at least once per year (Delfabbro et al., 2006).

In the current study, participants reported experiencing a high number of gambling consequences. These findings however, are not surprising given that the current study recruited for gamblers and almost half the sample were either at-risk or high-risk gamblers. Given that individuals in the at-risk and high-risk gambling classifications gamble at higher frequencies than low-risk gamblers, it is reasonable to expect that they would be more likely to experience gambling related consequences.

Sex differences. Findings regarding sex differences in gambling participation and consequences were consistent with past gambling literature with males reporting significantly higher levels of gambling activity participation and experiencing more consequences than females (e.g. Chalmers & Willoughby, 2006; Derevensky & Gupta, 2000; Desai, Maciejewski, Pantalon, & Potenza, 2005). To date, it is unclear why sex differences are consistently found in gambling research. It has been suggested however that in general, males tend to participate in more risky behaviours than females and have more positive attitudes towards gambling (Chiu & Storm, 2010).

With regards to participation in specific gambling activities, males had significantly higher participation rates for most of the gambling activities, while females only reported significantly higher participation rates for one activity (playing instant win or scratch tickets) indicating that males not only exhibit higher participation rates than females, but also participate in a greater variety of gambling activities than females. These findings may be explained by research on college student gambling practices that

have noted that gender differences may occur because of differences in leisure activity preferences. Specifically, research by Zenker and Wolfgang (1982) found that males preferred leisure activities such as gambling games while females preferred activities that utilized verbal skills, therefore females may be less likely to engage in gambling activities as they are often individually-oriented.

When examining preference for participation in specific gambling activities, the activity most commonly played by males was gambling on the internet while females most commonly played instant win or scratch tickets. Both males and females however, reported high levels of frequency for playing the lottery.

Age differences. The present study established that gambling activity participation did differ by age. Specifically, results indicated that older adolescents had higher gambling frequency averages than younger adolescents. This is consistent with past gambling research which has found that gambling participation increases with age (Gupta & Derevensky, 1998; Stinchfield, 2000). These findings may be due to increased availability of gambling related outlets as young people get older. Specifically, in Ontario, young people aged 17 have restricted access to gambling outlets such as purchasing lottery tickets, gambling online, and entering a casino (young people aged 18 are also restricted from casinos). Research on gambling availability and the development of problematic gambling, consistently demonstrates that increased access to gambling related outlets leads to an increase in pathological gambling diagnoses (Campbell & Lester, 1999; Ladouceur, Jacques, Ferland, & Girouz, 1999) and therefore as young people get older and they have more gambling options available, it is expected that gambling prevalence rates would increase.

Emerging adults, 23 years of age, reported the highest number of consequences experienced while emerging adults 18 years of age reported the lowest number gambling related consequences. These findings may similarly be explained by gambling availability as young people in their 20's are likely to have more access to gambling related activities giving them more opportunities to gamble. These individuals are therefore more likely to be at-risk or high-risk gamblers and therefore more likely to have experienced gambling related consequences. It should be noted that the location where the sample was drawn from was in close proximity to two large casinos and a race track.

Gambling Classifications

Prevalence rates of both at-risk and high-risk gamblers were inconsistent with previous gambling literature. In particular, the prevalence of at-risk and high-risk gamblers in the current study were higher (25% and 24%, respectively) than rates previously reported in literature (between four and eight percent for problem gamblers and between 10 and 15% for at-risk gamblers, Messerlian et al., 2005). These inconsistent findings may be due to this study's recruitment procedure. Specifically, recruitment methods recruited for individuals who gambled. It may be that the low-risk, recreational gambler does not consider them self a gambler and therefore more at-risk and high-risk gamblers responded to the recruitment strategy than would be typically found in a study of the general population which did not specifically recruit for gamblers.

Consistent with past research, males were more likely than females to be classified as high-risk gamblers (e.g., Chalmers & Willoughby, 2006; Poulin, 2002). In particular, 53% of males were classified as high-risk gamblers, while only 9% of females were classified as high-risk gamblers. These findings are consistent with earlier findings

of sex differences in overall prevalence and gambling activity and consequence frequency rates. With regards to age, high-risk gamblers had the highest average age which was expected given that both past research and current findings indicated that as young people get older they tend to gamble at a greater frequency (Gupta & Derevensky, 1998; Stinchfield, 2000). Therefore, it is reasonable to expect that as individuals get older they are more likely to have a high-risk gambling status.

Gambling activity frequency differences. Overall, problem gamblers had the highest frequency of gambling activity participation among the three groups of gamblers, followed by at-risk gamblers, and then low-risk gamblers. These findings were expected as gambling activity frequency was a central component of the classification requirements.

Findings also indicated that on the majority of the frequency items where significant differences were noted, at-risk gamblers presented participation rates more similar to low-risk gamblers rather than high-risk gamblers. This trend was evident for the following activities: playing the lottery, playing Sports Select or Pro-line, playing games of skill for money, betting or gambling on the internet, flipping coins or playing dice for money, playing slot machines, betting on sports teams, betting on horse races, and playing dice or card games at the casino. Although it is unknown why this trend exists, it may be the result of perceived level of skill. For example, for the majority of the items in which at-risk gamblers gamble at levels more like that of low-risk gamblers, a certain level of skill is believed to be needed. For instance, playing Pro-line or betting on sports teams or horse races may be perceived as games that utilize a greater level of skill and therefore if that skill is not present, the individual feels that there is a greater chance

of loss and therefore more consequences. Games such as buying raffle tickets and playing instant win tickets on the other hand, are games in which results ride solely on chance. High-risk gamblers often feel a personal sense of luck and often feel as if they exhibit power over gambling games (Moore & Ohtsuka, 1999) and may therefore be more likely to participate in games that have a higher level of perceived skill.

Gambling and Personality Differences

Gambling personality profiles. This study was the first to utilize a six-factor personality model with a late adolescent and emerging adult gambling population. Overall, three of the six HEXACO personality domains (Honesty-Humility, Conscientiousness, and Emotionality), along with impulsive sensation seeking and impulsivity, were able to significantly differentiate among the three groups of gamblers (low-risk, at-risk, and high-risk). For each of the HEXACO personality measures, high-risk gamblers reported the lowest scale scores, followed by at-risk gamblers; with low-risk gamblers reporting the highest scores. For the Impulsive Sensation Seeking and Impulsivity measures, high-risk gamblers presented the highest scores and low-risk gamblers presented the lowest scores.

High-risk gamblers. High-risk gamblers in the current study consistently demonstrated lower scores on the Honesty-Humility domain of the HEXACO-PI than at-risk or low-risk gamblers. These findings suggest that high-risk gamblers do not have a strong propensity towards truth and fairness when engaging with other people (Ashton & Lee, 2007). These results may be explained using cognitive gambling literature. Specifically, cognitive-based research on gambling behaviours has demonstrated that problem or pathological gamblers tend to have a different belief system than non-problem

gamblers (Chiu & Storm, 2010; Moore & Ohtsuka, 1999). In particular, individuals with problematic gambling tendencies tend to believe that they “need” money and that they have a greater ability to manipulate chance and therefore win more often than other people (Chiu & Storm, 2010; Moore & Ohtsuka, 1999). These individuals therefore are less concerned about the fairness associated with gambling as they likely have distorted cognitions and therefore feel as though they exert a certain level of control over the outcome (Moore & Ohtsuka, 1999). These findings are also consistent with initial hypotheses that high-risk gamblers would produce lower scores on the Honesty-Humility domain than both low-risk and at-risk gamblers.

Specifically, these individuals are less likely to avoid fraud and corruption and would therefore be more willing to gain by taking advantage of others through means of stealing or cheating (Ashton & Lee, 2007) than their low-risk or at-risk gambling peers. These findings may suggest that individuals who gamble at more problematic levels have personality traits which predispose them to having a need to win and are therefore more likely to be willing to gain by any means necessary.

Findings suggest also, that high-risk gamblers were more likely to have personality traits that suggested they viewed themselves as superior and therefore feel entitled to special treatment and privileges not afforded to others (Ashton & Lee, 2007). These findings were expected as past research on gambling motives has demonstrated that one often cited gambling motivation is to gain prestige from others (Smith & Preston, 1984). Similarly, personality research has demonstrated that problem or pathological gamblers were more likely to score high on traits such as extravagance (Nordin & Nylander, 2007). Therefore, it was expected that high-risk gamblers, those

who were gambling at higher frequencies, would produce lower scores on the Modesty facet and subsequently view themselves as superior. These findings are further supported by research on gambling and perceived control. In particular, past research has found that problem and pathological gamblers differ from non-problem gamblers with regards to cognitive processing and in particular, problem gamblers tend to present attitudes of overconfidence and therefore present greater gambling behaviour frequency (Goodie, 2005).

Finally, results from the Honesty-Humility domain demonstrated that high-risk gamblers had personality traits that indicated they were more likely to want to enjoy and flaunt wealth and privileges and are more interested in possessing lavish goods than low-risk or at-risk gamblers. In support of these findings, past research has found that monetary gain is consistently noted as one of the most widely cited gambling motivations in both adult and adolescent populations (Lee et al., 2007; Lostutter, Cronce, & Larimer, 2002; Smith & Preston, 1984). These findings are also consistent with initial hypotheses that high-risk gamblers would present lower scores on the Greed Avoidance facet of the Honesty-Humility domain than their low and at-risk gambling peers. Taken together, results from the Honesty-Humility domain indicate that high-risk gamblers, in general, have little regard for fairness and feel a personal sense of superiority and entitlement and are therefore willing to gain by any means necessary.

When examining the Conscientiousness domain of the HEXACO-PI it was evident that high-risk gamblers are less likely to want to engage in task oriented activities than low-risk gamblers. These findings support the initial hypothesis that high-risk gamblers would have lower scores on the Conscientiousness domain than low or at-risk

gamblers. These findings also support past research on gambling and personality that have utilized the five-factor personality model which have similarly found that pathological gamblers consistently scored lower on the Conscientiousness domain than non-pathological gamblers (Bagby et al., 2007; Kaare et al., 2009). It should be noted however, that although these findings are consistent, the study performed by Bagby et al. (2007) and Kaare et al. (2009) utilized a pathological gambling population which should not be compared directly to the “high-risk” gambling classification used in the present study.

Although overall the Conscientiousness domain was significant, only one of the facet level scales (Prudence) similarly yielded significant results. Therefore, the Organization, Diligence, and Perfectionism facet scales did not differentiate between the three groups of gamblers. All group means however were linear with high-risk gamblers presenting the lowest scores. These findings, although non-significant, are consistent with personality literature that shows that problem or pathological gamblers are more likely to score high on traits such as disorganized behaviour and low on traits such as self-directedness (Nordin & Nylander, 2007).

Current findings regarding self-discipline suggest that high-risk gamblers have little self-discipline and are therefore not likely to set goals and be motivated to achieve milestone in their lives. These findings did not support the initial hypothesis that high-risk gamblers would present lower scores than low or at-risk gamblers on the Diligence facet as these differences were not significant. Past research has presented differing results regarding self-discipline and gambling. In particular, Bagby et al., 2007, in their study on personality and gambling found significant differences between pathological

and non-pathological gamblers with regards to self-discipline. In a very similar study, using the same personality measure by Kaare et al. (2009), these findings were not supported. These conflicting findings may suggest that self-discipline is related to a problem gambling status but may not be definitive link to problem or pathological gambling and should be further explored.

In addition, results suggest that high-risk gamblers are more likely to act on impulse and are less likely to consider the consequences of their actions before proceeding than low-risk gamblers (Ashton & Lee, 2007). These findings are consistent with initial hypotheses as well as with literature on gambling and personality. Specifically, research has shown that individuals who gamble at frequent and problematic levels are more likely to act on impulse (Johansson et al, 2009; Loxton et al., 2008; McDaniel & Zuckerman, 2003; Nordin & Nylander, 2007).

Findings that high-risk gamblers are more likely to act on impulse than low-risk gamblers may be due to group differences in interest in gambling and the related gambling frequency. When looking at the three groups of gamblers, at-risk and high-risk gamblers may be more similar in nature in areas such as gambling interest. Low-risk gamblers in general, report the lowest level of gambling frequency participation and have often not experienced any gambling consequences. At-risk and high-risk gamblers on the other hand are more likely to show interest in gambling as their participation rates are higher despite having likely experienced at least one gambling related consequence. Therefore it is reasonable to find that at-risk and high-risk gamblers had very similar mean scores which were significantly different from those of low-risk gamblers. Also, at-risk gamblers are less likely to have experienced as many consequences as high-risk

gamblers and therefore may be more impulsive when gambling outlets present themselves. This suggestion is supported by past research that has shown that participants with high levels of impulsiveness are more likely to indicate a greater interest in gambling activities (McDaniel & Zuckerman, 2003).

By utilizing the Emotionality domain of the HEXACO-PI it was evident that high-risk gamblers are less likely to experience feelings of empathy, emotional attachment, or help-seeking behaviours with others (Ashton & Lee, 2007). Specifically, high-risk gamblers are less likely to feel fear even in the presence of potential harm and are often insensitive to physical pain, are less likely to share their fears and difficulties with other people as they would rather deal with their problems alone, are less inclined to feel a strong emotional attachment to others, and are often carefree and feel little stress even in times of difficulty (Ashton & Lee, 2007).

These findings are consistent with past literature that has demonstrated that high-risk or problem gamblers are more likely to participate in other risk behaviours that may result in physical or emotional harm, are more likely to avoid stressful situations (Nower, Derevensky & Gupta, 2004), as well as more likely to express carefree and outgoing attitudes than non-problem gamblers (Gupta et al., 2006). Past research utilizing the five-factor personality model however has rarely examined the Emotionality domain (or its five-factor equivalent Emotional Stability (vs. Neuroticism)) and therefore this study is one of the first to thoroughly examine this domain with a late adolescent and emerging adult gambling population.

The Openness to Experience domain was unable to distinguish among the three groups of gamblers which is consistent with past research utilizing the five-factor model.

However, facet level differences were noted for the Aesthetic Appreciation facet. These results indicated that high-risk gamblers were less likely to become absorbed in works of art and have little appreciation for natural wonders (Ashton & Lee, 2007) than low or at-risk gamblers. This finding may suggest that high-risk gamblers are highly absorbed by their need to gamble and are therefore less open to enjoying other things. These findings may also suggest that individuals who gamble at problematic levels prefer participating in activities with structure and routine rather than participating in activities or experiences that are less structured and more abstract.

At-risk and low-risk gamblers. Findings from the current study indicated that low-risk and at-risk gamblers reported significantly higher scores on the Honesty-Humility domain and therefore had a higher tendency towards fairness and truth than high-risk gamblers, were less likely to take advantage of other people, were less motivated by monetary gains or social status enhancements, and generally considered themselves to be ordinary people and did not expect any special privileges. These findings may suggest that activities such as gambling are less appealing to individuals who are not motivated by monetary or social status advancements and therefore individuals with these personality traits are less likely to become problem gamblers.

The Conscientiousness domain of the HEXACO-PI revealed that overall low-risk gamblers had the lowest score while at-risk gamblers had scores similar to both low and high-risk gamblers. Specifically, low-risk gamblers were more likely to engage in task oriented activities than high-risk gamblers. At-risk gamblers were also more likely to engage in task oriented activities than high-risk gamblers but still less likely than low-risk gamblers.

When examining impulsivity, low-risk gamblers demonstrated that they are more likely to consider the consequences of their actions before proceeding and are more likely to have self-control than at-risk or high-risk gamblers. On the Prudence facet of the HEXACO-PI, at-risk gamblers had scores more similar to that of high-risk gamblers demonstrating they are less likely to consider the consequences of their actions before proceeding and are less controlled than low-risk gamblers (Ashton & Lee, 2007). On the ImpSS measure of impulsivity, at-risk gamblers had scores in between both low-risk and high-risk gamblers and therefore did not significantly differ from either group. These findings may indicate that impulsivity is a key marker in distinguishing problematic gambling and therefore individuals with an “at-risk” gambling status are more likely to resemble high-risk gamblers on this trait. Similarly, a high score on measures of impulsivity for an at-risk gambler may indicate that they are at greater risk of becoming high-risk gamblers.

Through examining the Emotionality domain of the HEXACO-PI, it was evident that low-risk and at-risk gamblers had significantly more feelings of empathy, emotional attachment, and help-seeking behaviours than high-risk gamblers (Ashton & Lee, 2007). Similarly, low-risk gamblers were more inclined to avoid physical harm, more likely to share their fears and difficulties with individuals who would provide comfort, and more apt to feel a strong emotional attachment than high-risk gamblers (Ashton & Lee, 2007). For three of the four Emotionality facet scales (Fearfulness, Dependence, and Sentimentality) at-risk gamblers had scores in between and similar to both low-risk and high-risk gamblers and therefore no significant differences between at-risk gamblers and low or high-risk gamblers were noted. With regards to the Anxiety facet however, results

indicated that low-risk and at-risk gamblers are more likely to become anxious and preoccupied over minor problems (Ashton & Lee, 2007) than high-risk gamblers.

These findings suggest that low-risk and at-risk gamblers are better able to regulate their emotions than high-risk gamblers. Therefore these findings may suggest that individuals who are better able to manage their feelings and regulate their emotions are less likely to be problem gamblers. Past research has indicated that for some young people, gambling is a method of escape and may be utilized as coping mechanism or a means to acquire certain psychological needs (Nower & Blaszczynski, 2004). Consequently, young people who are able to express their feelings and share their fears with other individuals may be less likely to use gambling as a coping mechanism. Similarly, the finding that low and at-risk gamblers are more likely to experience anxiety and to become anxious over minor issues may suggest that gambling poses too much stress for these individuals. In particular, gambling is always accompanied by uncertain outcomes and therefore may only be enjoyed by young people who have a more carefree, less anxious personality.

In addition, the Aesthetic Appreciation of the Openness to Experience domain of the HEXACO-PI demonstrated that low-risk and at-risk gamblers tend to have a strong admiration for works of art and display a greater interest in natural wonders than high-risk gamblers (Ashton & Lee, 2007). These findings may indicate that individuals who are not consumed with thoughts of gambling and who do not spend large amounts of time or money on gambling related activities, are more likely to appreciate other things in the world around them.

Sensation seeking. Results revealed that sensation seeking could not significantly distinguish among the three groups of gamblers. These findings do not support the initial hypothesis that high-risk gamblers would exhibit higher levels of sensation seeking than low or at-risk gamblers. Although it was hypothesized that high-risk gamblers would report the highest levels of sensation seeking and would differ significantly on this trait from low-risk gamblers, these alternative findings are not alarming as research regarding sensation seeking is inconsistent. There are several studies that support the notion that problem gamblers present significantly higher levels of sensation seeking than non-problem gamblers (McDaniel & Zuckerman, 2003; Nordin & Nylander, 2007), however recent research has also found differing results. For example, in their study on gambling and personality, Bagby et al. (2007) found that there was no difference between pathological and non-pathological gamblers on the “excitement-seeking” (also referred to as sensation seeking) personality trait. Kaare et al. (2009) on the other hand, used the same personality measure, and found that pathological gamblers scored higher on the “excitement-seeking” trait, this finding however, was not significant.

Therefore, these findings may suggest that sensation seeking could be related to problematic gambling but is not a direct link to a problem gambling status (Kaare et al., 2009; Langewisch & Frisch, 1998). These findings may also suggest however that sensation seeking is only present in certain types of gamblers. For example, it may be that only individuals who gamble as a means to participate in risk-taking or exciting behaviours or to get “a rush” may exhibit this trait. Those individuals who gamble for other reasons (i.e., as a coping mechanism) would therefore likely not exhibit this trait. This suggestion should be further explored in future research.

Gambling and Self-esteem

Results indicated that at-risk gamblers reported the highest levels of self-esteem and low-risk gamblers reported the lowest levels of self-esteem. Further analyses were not conducted on this variable as self-esteem did not correlate with the gambling variables. This finding was surprising as several gambling studies have suggested that individuals with more problematic gambling behaviours often exhibit lower levels of self-esteem (Delfabbro et al., 2006; Kaare et al., 2009; Parke & Griffiths, 2005).

It is not clear why self-esteem was not correlated with gambling in the present study as it was in previous research. Previous research however has consistently found conflicting results regarding the role of self-esteem in gambling behaviour and has been unable to uncover the direction of the relationship between self-esteem and gambling. Given this conflict, it has been suggested that results regarding the relationship between self-esteem and gambling be interpreted with caution as it is unknown if self-esteem is risk factor, or instead, a product of gambling behaviour (Delfabbro et al., 2006; Kaare et al., 2007). Given that self-esteem was not correlated with gambling in the current study, it would suggest that self-esteem is a product of gambling rather than a risk-factor.

Specifically, these findings may suggest that with the sample used in the current study gambling participation may not have been at a point where the self-esteem of these young people was impacted. This is further supported by the personality profiles of high-risk gamblers in the current study that found that these individuals express carefree attitudes, have little anxiety, and feel entitled to privileges not afforded to others, suggesting they would be more likely to exhibit high rather than low self-esteem. The

relationship between self-esteem and gambling behaviour should be further explored in future research.

Overall, this study demonstrated that several differences in personality were noted among the different classifications of gamblers. These finds are important as they may aid in early identification of at-risk gamblers. Specifically, parents, teachers, clinicians, and social service workers can utilize this information to identify personality traits in young people that may put them at risk of potentially developing problem gambling tendencies. In particular, the current study, as well as several previous studies, have identified impulsivity as a likely personality trait in young people who gamble at problematic levels. Therefore it would be beneficial for a parent to be able to identify this particular personality trait in their child and monitor their behaviour to ensure gambling does not become problematic for that individual.

Gambling and Self-regulation

This study found that high-risk gamblers demonstrated the lowest levels of self-regulation while low-risk gamblers demonstrated the highest levels of self-regulation. Previous research found that individuals with the ability to self-regulate are better able to regulate their behaviours in challenging circumstances and are therefore less likely to act on impulse (Mason et al., 2010). Given that individuals who gamble at problematic levels often exhibit high levels of impulsivity (Nordin & Nylander, 2007), it is reasonable to find that young people who have the ability to suppress these impulses would gamble at less problematic levels, or not at all. Although research on self-regulation and gambling is limited (see Gupta et al., 2006), these findings have been supported within the substance abuse and adolescent risk-taking literature which has consistently found that

young people who have the ability to effectively self-regulate, are less likely to participate in risky behaviours (Gardner et al., 2008; Patrick et al., 2008; Verejo-Garcia et al., 2007).

The present study examined three self-regulation components including activation control, attentional control, and inhibitory control. Results indicated that each of the self-regulation components were able to differentiate among the three groups of gamblers with low-risk and at-risk gamblers consistently showing higher levels of self-regulation than high-risk gamblers. Therefore, in general, at-risk gamblers present self-regulatory scores similar to that of high-risk gamblers while low-risk gamblers are better able to perform an action or task even when one feels a strong urge to avoid it, have greater control over their emotions and are better able to shift their attention to optimize arousal and emotion, and have a greater capacity to inhibit pleasurable impulses when these impulses are unfavourable (Derryberry & Rothbart, 1988) than at-risk and high-risk gamblers. The results regarding the inhibitory control scale are of particular importance as they support earlier findings as well as past research that indicates that individuals with higher levels of impulsivity (unable to inhibit unfavourable impulses) are more likely to be problem gamblers (Loxton et al., 2008; McDaniel & Zuckerman, 2003; Nordin & Nylander, 2007). Therefore, findings may suggest that although some individuals present higher levels of impulsivity, if they also have the ability to self-regulate, this may decrease their chances of developing problematic gambling behaviours. This relationship should be further explored in future research studies.

Given that research on self-regulation and gambling is so limited, results from the present study are important as they demonstrate that low-risk gamblers, individuals who

gamble at the lowest frequency, present much strong self-regulatory skill than at-risk or high-risk gamblers. These findings suggest that self-regulation does play a role in gambling participation and may therefore play a role in reducing risk behaviours in young people.

These findings are especially important as they may aid in the development of intervention and prevention programs that utilize specific self-regulation techniques with a young gambling population. Given that the current study found a strong relationship between problem gambling and self-regulation, it would be beneficial to use this information to prevent young people from becoming problem gamblers or to be able to intervene in the lives of young people already gambling at problematic levels. Specifically, results demonstrated that individuals who gamble at lower frequencies, or not at all (low-risk gamblers), have a significantly greater ability to regulate their behaviours. Therefore, it would be beneficial if prevention and intervention programs were developed that utilize this information and teach self-regulatory processes to at-risk groups of young people.

Methodological Considerations

There were five limitations to this study. First, this study was cross-sectional in nature which limits its generalizability as well as restricting my ability to address any potential causal relationships. It would be beneficial therefore, that a longitudinal study be conducted in order to determine causal relationships. Second, this study had a relatively homogenous sample and therefore it is unknown if results would differ with a more diverse sample. The sample in the current study was however representative of the larger Brock University community from which the sample was drawn. Third, this study

specifically recruited for gamblers and therefore prevalence rates were not consistent with other general population studies and should not be compared.

Fourth, the data collection was based on a self-report measure and therefore a concern of response bias was present. Although this was of concern, data collection methods were used to enhance the likelihood of obtaining more accurate information. Such methods included ensuring participants understood that their responses were confidential, administering the survey in a controlled environment, and checking surveys for inconsistencies prior to data analysis. And finally, the sample size in the present study was smaller than those in several previous studies. This is important to note as in some cases sample size may have inhibited some statistical relationships from reaching a level of significance (in particular, the high-risk and at-risk gambling classifications had only 24 and 25 participants, respectively). Analyses were completed with weighted group data to increase the power available in the analyses. The weighted group data confirmed the findings with the non-weighted data. It is important to note however that several important relationships were found.

Suggestions for Future Research

Future research is required in several areas. First, as with past research, sex differences in gambling participation and consequences were found in this study and the reasons for these differences are unclear. Potential issues and questions for exploration of these differences include methodological considerations (are current screening tools capturing gambling behaviours of both males and females), are the gambling trajectories of males and females different, and are there specific factors that make females less likely to become problematic gamblers?

Second, this study was the first to utilize a six-factor personality screening tool (the HEXACO Personality Inventory) and several significant results were noted. Consequently, it would be beneficial to examine personality and gambling behaviours in young people utilizing a six-factor model with a larger sample in order to see if the pattern of results is consistent. The Honesty-Humility domain of the HEXACO (which is not present in the five-factor personality model) was a significant factor in differentiating low-risk, at-risk, and high-risk gamblers and therefore gave support for the use of a six-factor model in a gambling population. Similarly, the current study found a relationship between gambling and personality, especially on the Honesty-Humility domain, and therefore it would be beneficial to explore the relationship between personality and gambling motives since the Honesty-Humility domain of the HEXACO-PI measures constructs that can be understood through a further examination of common gambling motivations.

Third, future research should explore the methodological discrepancies found with self-esteem and sensation seeking in a gambling population. One possible suggestion may be to explore alternative self-esteem measures. There are different aspects to self-esteem and therefore examining these different aspects within a gambling population may explain some of the current inconsistencies. With regards to sensation seeking, it may be beneficial to look at this trait in conjunction with gambling motivations in order to explore if there is a relationship between the reasons behind why one gambles and their likelihood to exhibit the sensation seeking personality trait.

Finally, self-regulation was found to significantly differentiate among low-risk, at-risk, and high-risk gamblers. The current study found that low-risk and at-risk

gamblers exhibited higher levels of self-regulation than high-risk gamblers, however, the specific self-regulation mechanisms utilized are unclear. As a result, it would enhance gambling literature to understand the specific self-regulation techniques and mechanisms young adults may employ in order to resist urges and impulses. These findings would not only add to the body of literature on risk-taking and gambling but could similarly aid in the development and implementation of prevention and intervention programs.

Conclusions

Although research on late adolescent and emerging adult gambling is growing, several gaps in the literature still exist. The present study aimed to address some of these gaps by examining personality traits that may contribute to problem gambling behaviours as well as examining the role of self-regulation. In particular, this study was the first to use a six-factor personality model and therefore was the first to examine the Honesty-Humility personality domain with a gambling population.

Overall, this study demonstrated that several differences in personality were noted between low-risk, at-risk, and high-risk gamblers. Specifically, high-risk gamblers were less likely to have a strong propensity towards truth and fairness when engaging with other people. Specifically, these individuals are less likely to avoid fraud and corruption and would therefore be more willing to gain by taking advantage of others, are more likely to have personality traits that suggest they view themselves as superior, and are more likely to want to enjoy and flaunt wealth and privileges than low-risk or at-risk gamblers. In addition, high-risk gamblers are less likely to want to engage in task oriented activities and are more likely to act on impulse than low-risk gamblers. High-risk gamblers were also less likely to feel fear even in the presence of potential harm and

are often insensitive to physical pain, are less likely to share their fears and difficulties with other people, are less inclined to feel a strong emotional attachment to others, and are often carefree and feel little stress even in times of difficulty. Finally, results revealed that high-risk gamblers were less likely to become absorbed in works of art and have less appreciation for natural wonders than low or at-risk gamblers.

When examining low and at-risk gamblers, results demonstrated that low-risk and at-risk gamblers had a higher tendency towards fairness and truth than high-risk gamblers, were less likely to take advantage of other people, were less motivated by monetary gain, and generally considered themselves to be ordinary people. Also, at-risk and low-risk gamblers were more likely to engage in task oriented activities than high-risk gamblers. When examining impulsivity, low-risk gamblers demonstrated that they are more likely to consider the consequences of their actions before proceeding than at-risk or high-risk gamblers. At-risk gamblers on the other hand were less likely to consider the consequences of their actions and were less controlled than low-risk gamblers.

Findings also demonstrated that low-risk and at-risk gamblers had significantly more feelings of empathy, emotional attachment, and help-seeking behaviours than high-risk gamblers. Similarly, low-risk gamblers were more inclined to avoid physical harm, more likely to share their fears and difficulties with others, and more apt to feel a strong emotional attachments. In addition, low-risk and at-risk gamblers are more likely to become anxious and preoccupied over minor problems than high-risk gamblers. Lastly, results demonstrated that low-risk and at-risk gamblers tend to have a strong admiration for works of art and display a greater interest in natural wonders than high-risk gamblers.

Literature examining the role of self-regulation in the development of gambling behaviours is limited. Subsequently, this study aimed to gain a better understanding of self-regulation and to examine whether or not self-regulation has the ability to differentiate between the three groups of gamblers (low-risk, at-risk, and high-risk). Overall, low-risk gamblers had the highest levels of self-regulation while high-risk gamblers had the lowest levels of self-regulation. These findings provide support for the notion that the ability to self-regulate may play a role in inhibiting the acquisition of problem gambling tendencies. These findings are especially important as they may aid in the development of intervention and prevention programs specifically designed for a gambling population.

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Appendix A

Research Ethics Board Project Approval

DATE: August 19, 2009

FROM: Michelle McGinn, Chair
Research Ethics Board (REB)

TO: Dr. Heather Chalmers, Child & Youth Studies
Kate Twiggers

FILE: 09-015 CHALMERS/TWIGGER
Faculty Research

TITLE: An Examination of the role personality and self-regulation in gambling behaviours: A pathway model approach

The Brock University Research Ethics Board has reviewed the above research proposal.

DECISION: ACCEPTED (WITH NOTES)

- The consent form should indicate that participant data cannot be destroyed or removed once the survey has been handed in as responses are anonymous.
- Participants should be advised whether withdrawal renders them ineligible for the 'draw' or for the research credit.
- Note that in the questionnaire when you ask about the grade levels achieved, the "C" level is listed as "60%-96%" rather than "69%".
- Given that you are studying potentially problematic gambling behaviours, you may wish to reconsider whether you wish to use a lottery as a form of potential compensation since it may undermine any claims that gambling is serious and may require some form of intervention.

This project has received ethics clearance for the period of **August 19, 2009 to August 31, 2010** subject to full REB ratification at the Research Ethics Board's next scheduled meeting. The clearance period may be extended upon request. *The study may now proceed.*

Please note that the Research Ethics Board (REB) requires that you adhere to the protocol as last reviewed and cleared by the REB. During the course of research no deviations from, or changes to, the protocol, recruitment, or consent form may be initiated without

prior written clearance from the REB. The Board must provide clearance for any modifications before they can be implemented. If you wish to modify your research project, please refer to <http://www.brocku.ca/researchservices/forms> to complete the appropriate form Revision or Modification to an Ongoing Application.

Adverse or unexpected events must be reported to the REB as soon as possible with an indication of how these events affect, in the view of the Principal Investigator, the safety of the participants and the continuation of the protocol.

If research participants are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and clearance of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research protocols.

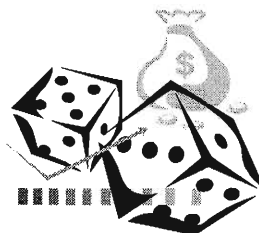
The Tri-Council Policy Statement requires that ongoing research be monitored. A Final Report is required for all projects upon completion of the project. Researchers with projects lasting more than one year are required to submit a Continuing Review Report annually. The Office of Research Services will contact you when this form *Continuing Review/Final Report* is required.

Please quote your REB file number on all future correspondence.

MM/an

Sample Recruitment Poster

****Participate in a gambling study****



Who is needed:	Males and females <24 years of age
What is involved:	Fill out a 45 minute questionnaire
What do you get:	A chance to win a \$100 Best Buy gift certificate or 1.5 hours of research credit
	<ul style="list-style-type: none">• Contact Kate to participate!

hchalmer@brocku.ca

This research has been cleared by the Brock University Research and Ethics Board: REB # 09-015

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Appendix C

Consent Form

Informed Consent

Date: September 2009

Project Title: An examination of the role of personality and self-regulation in gambling behaviours: A pathway model approach

Principal Student Investigator:
Kate Twigger, MA Candidate
Department of Child and Youth Studies
Brock University
(905) 688-5550 Ext. 5534
kt03ir@brocku.ca

Faculty Supervisor:
Dr. Heather Chalmers
Department of Child and Youth Studies
Brock University
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Invitation

You are invited to participate in a study that involves research. The goals of the study are to find out more about gambling behaviours (e.g., betting on sports teams, playing the lottery or scratch cards, playing cards for money, etc.) and personality.

What is involved

As a participant, you will be asked to complete a survey package on Brock University campus. An instruction sheet will be included in your package that will indicate how to complete the survey. Participation will take approximately 45 minutes of your time.

Potential benefits and risks

Possible benefits of participation include the potential to create self-awareness of your own gambling behaviours not previously acknowledged. You will also have a chance to earn 1.5 hours of research credit or enter a draw to win a 100\$ Best Buy gift certificate. This draw will take place March 2010. There are no known or anticipated risks associated with participation in this study.

Confidentiality

All information you provide is considered confidential; your name will not be included or, in any other way, associated with the data collected in the study. Participant data cannot be destroyed or removed once the survey has been handed in to the researcher as responses are anonymous. Once the data is collected the data will be kept in one locked cabinet, while the consent forms will be locked in a separate cabinet. Data will be kept for seven years after which time the data will be destroyed. Access to this data will be restricted to Kate Twigger and Dr. Heather Chalmers.

Voluntary participation

Participation in this study is voluntary. If you wish, you may decline to answer any questions or participate in any component of the study. Further, you may decide to withdraw from this study at any time up until the data collection procedure is complete and may do so without any penalty. Participants who choose to withdrawal will still be eligible for the draw or research credit.

Publication of results

Results of this study may be published as a thesis, in professional journals and presented at conferences. Feedback about this study will be available to you upon request in summer 2010. For information about the results of this study contact Kate Twigger at kt03ir@brocku.ca.

Contact information and ethics clearance

If you have any questions about this study or require further information, please contact the Principal Student Investigator using the contact information provided above. This study has been reviewed and received ethics clearance through the Research Ethics Board at Brock University (REB # 09-015). If you have any comments or concerns about your rights as a research participant, please contact the Research Ethics Office at (905) 688-5550 Ext. 3035, reb@brocku.ca.

Thank you for your assistance in this project. Please keep a copy of this form for your records.

I agree to participate in this study described above. I have made this decision based on the information I have read in the Information-Consent Letter. I have had the opportunity to receive any additional details I wanted about the study and understand that I may ask questions in the future. I understand that I may withdraw this consent at any time.

Name: _____

Signature: _____ Date: _____

Appendix D

Debriefing Form

Thank you!

We appreciate your help with our study. All the answers and information you provided throughout the entire research process will be grouped with the answers from all other young people who participated in this study. We will analyze all this information so we can better understand gambling behaviours and personality in young people. Health professionals, counsellors, as well as academics will be able to use this information to help identify young adults at-risk for problem gambling or youth who are currently experiencing gambling related problems. This information may also help develop intervention programs in the Niagara Region that will help young people to make positive lifestyle choices.

Sometimes, after you do a study like this, you want to talk to someone about your answers. If you want to talk about any of the topics that were covered in this study, you can call:

Distress Centre Niagara (24 hour crisis line)	905-688-3711
Parent Help Line	1-888-603-9100
Niagara Centre for Youth Care	1-800-263-4944
Community Addiction Services Niagara	905-684-1183
Problem Gambling Program (24 hour phone service)	905-684-1859
Problem Gambling Help Line (toll free)	1-888-230-3505

The results of this study will be available to you in the form of a written document Summer 2010. You can get information about the results – or any part of this study – by contacting Kate Twigger – kt03ir@brocku.ca - at Brock University.

For information about the signs of problem gambling and responsible gambling guidelines please look at the “Frequently Asked Questions” web page on the Responsible Gambling Council of Ontario’s website: http://www.responsiblegambling.org/faqs_facts_on_demand.cfm

Did you know?

In Canada, 4-8% of teenagers have a serious gambling problem;
and 10-14% of teens are at-risk for developing a serious gambling problem.

Many teenagers do not think that hockey pools, Pro-line, break-open tickets,
scratch tickets or lottery tickets are gambling activities – they are!

Gambling can be fun if you are of the legal age to gamble and gamble responsibly;
but many teens who gamble too much end up with problems at school, or with their friends and family.

If you gamble too much, it’s a good idea to call the numbers above.

Appendix E

Intercorrelations between Gambling Variables and the Honesty-Humility Facet Scales

	1	2	3	4	5	6	7	8
1. Participants sex	-	-	-	-	-	-	-	-
2. Participants age	-.382**	-	-	-	-	-	-	-
3. SOGS score	-.393**	.167	-	-	-	-	-	-
4. Gambling frequency score	-.558**	.289**	.640**	-	-	-	-	-
5. Gambling classification	-.466**	.229*	.891**	.736**	-	-	-	-
6. Sincerity facet	.020	-.044	-.131	-.136	-.157	-	-	-
7. Fairness facet	.316**	-.045	-.285**	-.287**	-.288**	.378**	-	-
8. Greed Avoidance facet	.229*	-.126	-.226*	-.289*	-.243*	.463**	.295**	-
9. Modesty facet	.347**	-.075	-.257**	-.129	-.258**	.253*	.246*	.233*

Note. $N = 100$. * $p < .05$, ** $p < .01$.

Appendix F

Intercorrelations between Gambling Variables and the Emotionality Facet Scales

	1	2	3	4	5	6	7	8
1. Participants sex	-	-	-	-	-	-	-	-
2. Participants age	-.382**	-	-	-	-	-	-	-
3. SOGS score	-.393**	.167	-	-	-	-	-	-
4. Gambling frequency score	-.558**	.289**	.640**	-	-	-	-	-
5. Gambling classification	-.466**	.229*	.891**	.736**	-	-	-	-
6. Fearfulness facet	.414**	-.142	-.283**	-.233*	-.207*	-	-	-
7. Anxiety facet	.477**	-.240*	-.190	-.225*	.194	.461**	-	-
8. Dependence facet	.482*	-.054	-.164	-.214*	-.198*	.321**	.304**	-
9. Sentimentality facet	.447**	-.281**	-.182	-.225*	-.199*	.296*	.471**	.606**

Note. $N = 100$. * $p < .05$, ** $p < .01$.

Appendix G

Intercorrelations between Gambling Variables and the Extraversion Facet Scales

	1	2	3	4	5	6	7	8
1. Participants sex	-	-	-	-	-	-	-	-
2. Participants age	-.382**	-	-	-	-	-	-	-
3. SOGS score	-.393**	.167	-	-	-	-	-	-
4. Gambling frequency score	-.558**	.289**	.640**	-	-	-	-	-
5. Gambling classification	-.466**	.229*	.891**	.736**	-	-	-	-
6. Social Self-Esteem facet	-.230*	.253*	-.039	-.002	-.059	-	-	-
7. Social Boldness facet	-.081	.020	.147	-.076	.090	.375**	-	-
8. Sociability facet	.046	-.138	-.077	.002	-.119	.210*	.359**	-
9. Liveliness facet	-.200*	.072	.003	.069	-.024	.463**	.364**	.362**

Note. $N = 100$. * $p < .05$, ** $p < .01$.

Appendix H

Intercorrelations between Gambling Variables and the Agreeableness Facet Scales

	1	2	3	4	5	6	7	8
1. Participants sex	-	-	-	-	-	-	-	-
2. Participants age	-.382**	-	-	-	-	-	-	-
3. SOGS score	-.393**	.167	-	-	-	-	-	-
4. Gambling frequency score	-.558**	.289**	.640**	-	-	-	-	-
5. Gambling classification	-.466**	.229*	.891**	.736**	-	-	-	-
6. Forgiveness facet	.073	.066	-.089	-.078	-.135	-	-	-
7. Gentleness facet	.177	-.137	-.132	.026	-.072	.378**	-	-
8. Flexibility facet	.000	-.034	-.051	-.006	-.100	.411**	.501**	-
9. Patience facet	-.171	.115	-.140	-.082	-.113	.357**	.420**	.547**

Note. $N = 100$. * $p < .05$, ** $p < .01$.

Appendix I

Intercorrelations between Gambling Variables and the Conscientiousness Facet Scales

	1	2	3	4	5	6	7	8
1. Participants sex	-	-	-	-	-	-	-	-
2. Participants age	-.382**	-	-	-	-	-	-	-
3. SOGS score	-.393**	.167	-	-	-	-	-	-
4. Gambling frequency score	-.558**	.289**	.640**	-	-	-	-	-
5. Gambling classification	-.466**	.229*	.891**	.736**	-	-	-	-
6. Organization facet	.193	.058	-.154	-.177	-.169	-	-	-
7. Diligence facet	.215*	-.075	-.133	-.082	-.144	.479**	-	-
8. Perfectionism facet	.287**	-.012	-.149	-.113	-.105	.595**	.653**	-
9. Prudence facet	.124	.129	-.295**	-.254*	-.266**	.478**	.384**	.406**

Note. $N = 100$. * $p < .05$, ** $p < .01$.

Appendix J

Intercorrelations between Gambling Variables and the Openness to Experience Facet Scales

	1	2	3	4	5	6	7	8
1. Participants sex	-	-	-	-	-	-	-	-
2. Participants age	-.382**	-	-	-	-	-	-	-
3. SOGS score	-.393**	.167	-	-	-	-	-	-
4. Gambling frequency score	-.558**	.289**	.640**	-	-	-	-	-
5. Gambling classification	-.466**	.229*	.891**	.736**	-	-	-	-
6. Aesthetic Appreciation facet	.289**	-.113	-.100	-.231*	-.184	-	-	-
7. Inquisitiveness facet	-.167	.203*	.118	.120	.151	.491**	-	-
8. Creativity facet	-.013	-.093	-.055	-.071	-.135	.425**	.183	-
9. Unconventionality facet	-.128	-.054	-.002	.019	.018	.391**	.319**	.328**

Note. $N = 100$. * $p < .05$, ** $p < .01$.

Appendix K

HEXACO Summary Table

Facet	<i>M (SD)</i>			<i>F</i>	<i>df</i>	<i>p</i>
	Low-risk	At-risk	High-risk			
Honesty-Humility	3.28a (0.53)	3.18a (0.50)	2.78b (0.53)	16.06	2,170	<.001
Sincerity	3.21a (0.69)	3.15a (0.64)	2.94a (0.63)	2.95	2,170	.055
Fairness	3.53a (0.91)	3.33a (0.95)	2.85b (0.77)	9.99	2,170	<.001
Greed Avoidance	2.65a (0.81)	2.66a (0.85)	2.10b (0.70)	10.40	2,170	<.001
Modesty	3.74a (0.78)	3.57ab (0.57)	3.24b (0.82)	7.16	2,170	.001
Conscientiousness	3.65a (0.62)	3.41ab (0.43)	3.34b (0.72)	3.86	2,170	.023
Organization	3.67a (0.88)	3.42a (0.89)	3.32a (0.87)	2.39	2,170	.095
Diligence	3.88a (0.75)	3.70a (0.53)	3.64a (0.81)	1.71	2,170	.184
Perfectionism	3.56a (0.78)	3.52a (0.70)	3.35a (0.78)	1.29	2,170	.279
Prudence	3.48a (0.70)	3.02b (0.62)	3.03b (0.91)	6.17	2,170	.003
Emotionality	3.64a (0.63)	3.52a (0.59)	3.20b (0.62)	8.28	2,170	<.001
Fearfulness	3.36a (0.84)	3.26ab (0.86)	2.90b (0.87)	4.97	2,170	.008
Anxiety	3.82a (0.82)	3.87a (0.76)	3.38b (0.84)	7.06	2,170	.001
Dependence	3.64a (0.90)	3.33ab (0.95)	3.23b (0.82)	3.41	2,170	.036
Sentimentality	3.74a (0.80)	3.63ab (0.68)	3.32b (0.97)	4.14	2,170	.017
Openness to Experience	3.17a (0.59)	3.21a (0.51)	3.08a (0.70)	0.80	2,170	.453
Aesthetic Appreciation	3.21a (0.85)	3.21a (0.74)	2.77b (0.99)	5.11	2,170	.007
Inquisitiveness	2.64a (0.87)	2.79a (0.86)	2.97a (0.97)	2.00	2,170	.138
Creativity	3.55a (0.87)	3.42a (0.86)	3.25a (0.99)	1.62	2,170	.202
Unconventionality	3.31a (0.60)	3.42a (0.53)	3.31a (0.76)	0.52	2,170	.596
Extraversion ^a	3.58 (0.52)	3.48 (0.49)	3.56 (0.59)			
Agreeableness ^a	3.09 (0.50)	2.86 (0.56)	2.91 (0.66)			

Note. *N* = 173 (for the weighted analyses). Subscripts indicate significant group differences.

^aNo further analyses were conducted on the Extraversion or Agreeableness variable as they were not correlated with the gambling variables.